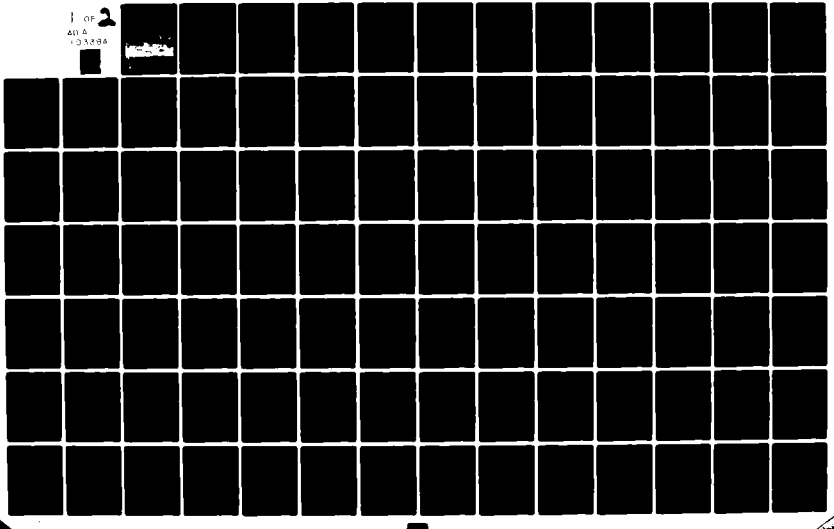
AD-A103 384 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS F/G 13/13
LIST OF SOILS, SOIL-STRUCTURE INTERACTION AND OTHER RELATED COM--ETC(U)
MAY 81 N RADHAKRISHNAN, P K SENTER

UNCLASSIFIED WES-TR-K-81-1 NL



TECHNICAL REPORT K-81-1

LIST OF SOILS, SOIL-STRUCTURE INTERACTION AND OTHER RELATED COMPUTER PROGRAMS AVAILABLE FOR LMVD ENGINEERS

Compiled by

N. Radhakrishnan and Paul K. Senter

Automatic Data Processing Center
U. S. Army Engineer Waterways Experiment Station
P. O. Box 631, Vicksburg, Miss. 39180

May 1981

Final Report

Prepared for U. S. Army Engineer Division, Lower Mississippi Valley
P. O. Box 80, Vicksburg, Miss. 39180

Destroy this report when no longer needed. Do not return it to the originator.

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

The contents of this report are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such commercial products.

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER (14) WES-TR-K-81-1 / 2. GOVT ACCESSION NO. AD-A103 384	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) (6) LIST OF SOILS, SOIL-STRUCTURE INTERACTION, AND OTHER RELATED COMPUTER PROGRAMS AVAILABLE FOR LMVD ENGINEERS.	5. TYPE OF REPORT & PERIOD COVERED (9) Final report. / 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) (10) N. Radhakrishnan, Paul K. Senter	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, Miss. 39180	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS U. S. Army Engineer Division, Lower Mississippi Valley, P. O. Box 80, Vicksburg, Miss. 39180 (11)	12. REPORT DATE May 1981 / 13. NUMBER OF PAGES 146
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) (12) 1471	15. SECURITY CLASS. (of this report) Unclassified / 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.	
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)	
18. SUPPLEMENTARY NOTES Available from National Technical Information Service, Springfield, Va. 22161.	
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Computer programs; Soil mechanics; Soil-Structure interaction; Soils; Structural engineering	
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report presents a list of soils, soil-structure interaction, and other related computer programs available for engineers of the Lower Mississippi Valley Division. Programs for use in the following subject areas are listed: T-walls; slope stability; piles, sheet piles, and cells; seepage; stress computation, settlement, and consolidation; piezometer data; instrumentation and laboratory data; plotting programs; finite element and finite difference methods; earthquakes and dynamics; and others. Also included are abstracts of some of the listed programs.	

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

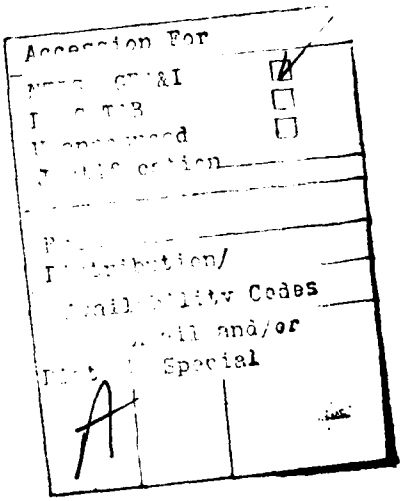
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

PREFACE

This report presents a list of computer programs compiled at the U. S. Army Engineer Waterways Experiment Station (WES) as part of the normal operation of the joint WES and U. S. Army Engineer Division, Lower Mississippi Valley (LMVD), Computer Center for fiscal years 1980 and 1981.

The list was compiled and this report prepared by Dr. N. Radhakrishnan and Mr. Paul K. Senter, Automatic Data Processing (ADP) Center, based on input received from the LMVD Districts and from the WES laboratories. Gratitude is expressed to these offices for their cooperation in the effort. LMVD technical contact for this work was Mr. Tony Young, Geology, Soils and Materials Branch. Mr. Donald L. Neumann was Chief of the ADP Center during the performance of the work.

Director of WES during the period of the work was COL N. P. Conover, CE. Technical Director was Mr. F. R. Brown.



CONTENTS

LIST OF SOILS, SOIL-STRUCTURE INTERACTION, AND OTHER RELATED COMPUTER PROGRAMS AVAILABLE FOR LMVD ENGINEERS

PART I: INTRODUCTION

History of Program List

1. In June 1975, the Automatic Data Processing (ADP) Center of the U. S. Army Engineer Waterways Experiment Station (WES) published for the U. S. Army Engineer Division, Lower Mississippi Valley (LMVD), a list of soils, structures, soil-structure interaction, and other related computer programs available for LMVD engineers. In February 1978, a more comprehensive list of available structures programs was published as WES Technical Report K-78-1, "List of Computer Programs for Computer-Aided Structural Engineering." During the 5 years since the original list of soils programs was introduced, a number of other useful programs have become available. This is especially true in the case of programs with computer graphics capabilities, which have become more prevalent in the Corps. It has also become evident that some of the programs need to be deleted from the original list.

2. This new list is the product of omitting the structures programs and updating and rearranging the original list. As an additional feature, abstracts of some of the listed programs are included in Part III of this report.

Subject Groupings

3. The programs have been grouped under the following subject groupings in Part II of this report:

1. T-Walls
2. Slope Stability
3. Piles, Sheet Piles & Cells
4. Seepage
5. Stress Computation, Settlement, & Consolidation

6. Piezometer Data
7. Instrumentation & Laboratory Data
8. Plotting Programs
9. Finite Element Method/Finite Difference
10. Earthquakes & Dynamics
11. Others

Abstracts

4. The computer program abstracts that are included in Part III are arranged by the same subject groupings.

Abbreviations

5. Abbreviations of computer systems or equipment used in this report are defined as follows:

BCS	-	Boeing Computer Services Corporation Control Data computers
CARDIN	-	Subsystem on Honeywell that allows submission of jobs from time-sharing for batch processing
H-635	-	The WES Honeywell G635 computer
OPM	-	Office of Personnel Management Honeywell 6000 series computer located at Macon, Ga.
TEK 4051	-	Tektronix computer screen, desktop graphics compatibility system
TEK 4081	-	Tektronix computer graphics system
TEK 4662	-	Tektronix interactive digital plotter
TEK 4907	-	Tektronix file management system to allow off-line digitizing using Tektronix 4014 graphics terminal with option 5
TSS	-	Time-sharing system

Additional Information

6. Programs that are part of the Conversationally Oriented Real-Time Program-Generating System (CORPS) library, the WES computer program library (WESLIB), the Engineering Computer Program Library (ECPL), or a

District library are so noted in the list. Documentation of the programs in the ECPL can be obtained from the Technical Information Center at WES (phone: 601-634-2581 or FTS 542-2581).

7. Program information is also available from the individuals listed in the "Author/Contact" column of the list. General information on all the programs can also be obtained from the Computer-Aided Design Group, ADP Center, WES (phone: 601-634-2568 or FTS 542-2568).

PART II: LIST OF AVAILABLE PROGRAMS

1. T-Walls

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
G-WALL	R. Hall, WESKA			H-635 OPM TSS		X	Y		Deep seated sliding stability analysis of structures. The analysis is a wedge method slope-stability analysis that follows the design procedures used in the LMVD for analysis of plane failures. The program provides for calculation of uplift by entering profile of force water seepage pressures.
TWDA	W. Price R. Hall R. Mosher, H. Jones, M. George WESKA	CORPS	713-F3R0027	OPM BCS TSS		X	Y		Analysis or design of an inverted T-Wall subjected to retaining wall and/or floodwall loadings. Design comparisons for finding the most economical combination of base embedment, key length, base width, and base slope are based on construction cost of excavation, concrete, and backfill. Performs stability analysis or design and structural analysis or design. Conforms to EM 1110-2-2501, EM 1110-2-2502, and other Corps of Engineers procedures. Active earth pressures may be calculated by Coulomb's equations or by the incremental wedge method. The program is highly interactive, following a computer-aided design methodology. The analysis procedure considers overturning, sliding, and bearing pressure, relative to the soil immediately adjacent to the wall.

2. Slope Stability

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
6STAB	L. Manson, LMN Giles, LMK		741-G9A4010	H-635 H-437 TSS TEK4081	X	X	Y		Slope stability analyses, method of planes, wedge method.
CHANELS	R. Brittain, LMM			H-635 TSS					Slope stability program utilizing the method of planes. The program is written in conversational FORTRAN IV with the purpose of keeping input to a minimum while retaining sufficient flexibility to allow its usage for most conditions encountered in the design and analysis of Type B channel sections with variable channel bank and excavated material slopes. The program is applicable only to horizontal soil strata.
DATACHECK	G. Wardlaw LMK			TEK 4081		X		N	Performs datacheck and plots input data file for STAB/LMVD wedge method analysis and executes STAB Program for analysis.

2. Slope Stability

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED YES	DOCUMENTED NO	DESCRIPTION
					DRUM PLOT	TEK PLOT			
MASTER STABILITY ANALYSIS	L. Manson K. Broussard LMN		741-X6A2520 NOD Engr # 7K70003	BCS TSS				N	The program performs the stability analysis used to help determine the critical profile of any natural or man-made earth slope embankment for which shear failure could occur along a surface aproximated by a series of planes. It uses the wedge method of stability analysis to design either a minimum section or revetment foundation thru an interactive procedure.
			741-F3A2520 NOD Engr # 5K71007	H-635 TSS				N	
PIC 2	T. Wolff, LMS			BCS TSS		X		N	Gives graphic display of input data for SLD wedge slope stability (time-sharing version). Allows "windowing" of data.
PICTURE	T. Wolff, LMS			H-635 BCS TSS		X		N	Gives graphic display of input data for NOD slope stability program "UPMASTAB" (same as CORPS program I0005). Allows windowing of data.

2. Slope Stability

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
SLIP CIRCLE SLOPE STABILITY WITH SIDE FORCES (I0013)	D. Spaulding NCS /W. Jones, WESKA	CORPS	741-I1F5030	H-635 BCS OPM TSS			Y		Performs slip circle slope stability calculations on embankments or natural slopes in accordance with EM 1110-2-1902, draft Feb 1968. The program calculates the factor of safety against sliding for a series of trial arcs tangent to a horizontal plane, and locates the circle with the least factor of safety.
SLOPE	R. Hall, WESKA	WESLIB		H-635 TSS	X	X	Y		An interactive graphics program. Solves slope stability problems and displays results graphically and produces drum plots.
SLOPE II	Geo-Slope Programming,Ltd. /R. Mosher, WESKA E. Edris, WESGE			BCS			Y		Slope stability package containing Felenius or Ordinary Method, Simplified Bishop Method, Spencer Method Janbu Simplified Method, Janbu Generalized Method, Morgenstern-Price Method, Nonvellier Method, Lowe-Karafiath Method, Corps of Engineers Method, and Modified Swedish Method. Pore pressure can be handled by linear coefficient, a non-linear coefficient, a series of piezometric lines, or a grid of pore pressure values.

2. Slope Stability

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
SLOPE STABILITY ANALYSIS BY METHOD OF WEDGES (I0006)	L. Manson, LMN	CORPS	713-F3A2160	H-635 BCS OPM TSS			Y		Determines the factor of safety using the stability analysis by the method of wedges on any embankment or slope.
SLOPE STABILITY ANALYSIS WITH PLOT ROUTINES Mod #2	L. Manson J. Montegut P. Oakland K. Broussard LMN		741-X6A217A NOD Engr # 8K70001	H-635 TSS BCS				N	The program determines the factor of safety using stability analysis by the method of wedges on any embankment or slope. In addition, the program outputs the data required to generate a Calcomp 925/1036 drum plot of the stability analysis plate from program 741-X6-A2-17B.
SLOPE STABILITY ANALYSIS WITH PLOT ROUTINES	L. Manson J. Montegut P. Oakland LMN		741-F3A217A NOD Engr # 8K70003	TSS BCS				N	The program determines the factor of safety using stability analysis by the method of wedges on any embankment or slope. In addition, the program outputs the data required to generate a Calcomp 925/1036 drum plot of the stability analysis plate from program 741-X6-A2-17B.

2. Slope Stability

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
SLOPE STABILITY ANALYSIS PLOT	L. Manson J. Montegut LMN		741-F3A217B NOD Engr # 6K71007	H-635 TSS	X			N	The program is intended to have general application in providing the safety analysis of any natural or man-made earth slope embankment for which shear failure may occur along a surface approximated by a series of planes. The program is directly applicable to all cases for which the wedge method of stability analysis is valid.
SLOPE STABILITY USING GENERALIZED FAILURE SURFACE (I0014)	D. Spaulding NCS /W. Jones, WESKA	CORPS	741-P5F020	H-635 BCS OPM TSS			Y		Performs slope stability calculations on embankment or natural slopes in accordance with EM 1110-2-1902, April 1970. Calculates factors of safety for failure surfaces defined by (1) a series of up to 50 straight line segments or (2) an upslope wedge, neutral block and downslope wedge. Will minimize factor for failure surfaces described by method 2.
SLOPWE	L. Manson, LMN G. Wardlaw, LMK R. Hall, WESKA		741-G9A4030	H-437 TSS	X	X	Y		Slope stability analysis, method of planes with plot.

2. Slope Stability

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS DRUM PLOT	GRAPHICS OPTIONS TEK PLOT	DOCUMENTED YES	DOCUMENTED NO	DESCRIPTION
SSA003	J. Cheek, WESSS	WESLIB ECPL	741-F3R0003	H-635 TSS			Y		Slope stability analysis circular arc method that follows the design procedures outlined in EM 1110-2-1902 dated 27 Dec 1960. In analysis mode, the program will handle cases of after construction, sudden drawdown, steady seepage and partial pool and automatically locate critical pool elevations.
SSW028	J. Cheek, WESSS R. Hall, WESKA	WESLIB	741-F3R0028	H-635 TSS			Y		This program utilizes a wedge method slope stability program that follows the design procedures used in the Lower Mississippi Valley Division for analysis of plane failures. The program provides for calculating safety factors for the after construction, sudden drawdown, partial pool, and steady seepage cases.
SSW039	J. Cheek, WESSS	WESLIB ECPL	741-F3R0039	H-635 TSS			Y		The program is intended to have general application in providing the safety analysis of any natural or man-made earth slope for which the wedge method with excess pore water pressure is valid.

2. Slope Stability

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS: DRUM PLOT	GRAPHICS OPTIONS: TEK PLOT	DOCUMENTED: YES	DOCUMENTED: NO	DESCRIPTION
STAB	G. Wardlaw, LMK			TEK4081		X		N	Stability analysis program to determine safety factors using method of planes or LMVD Wedge Method.
STABILITY WITH UPLIFT (I0005)	L. Manson D. Beer LMN	CORPS	741-F3A2530	BCS OPM H-635 TSS			Y		Determines the safety analysis of any natural or man-made earth slope embankment for which shear failure may occur along a surface approximated by a series of planes.
WDG	V. Fowler, LMS		741-X6A319A	BCS TSS			Y		Slope stability, wedge method, based on EM 1110-2-1902, 1970.
WEDGE80	Y. S. Jeng, WESGE			H-635 TSS		X		N	Wedge method based on the EM 1110-2-1902, 1970.
WES104 (I0009)	Y. S. Jeng, WESGE	CORPS	741-F3R0104	H-635 OPM BCS TSS				N	Modified Swedish Method is used for slope stability analysis (EM 1110-2-1902, 1970).
W104P	Y.S. Jeng, WESGE			H-635 BATCH	X			N	Plot program for WES104.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS DRUM PLOT	GRAPHICS OPTIONS TEK PLOT	DOCUMENTED YES	DOCUMENTED NO	DESCRIPTION
1ANPI	G. Wardlaw, LMK		741-F3A4090	H-437 H-635 TSS			Y		Analysis of anchored sheet pile retaining wall by the free earth support method with seepage forces.
1CANPI	G. Wardlaw, LMK			H-437 H-635 TSS			Y		Analysis of cantilevered sheet pile retaining wall with seepage forces.
3-D PILE FOUNDATION ANALYSIS	H. Edgecombe LMN		713-F3A2210 NOD Engr # K27010	H-635 CARDIN BATCH BCS/TSS				N	3-Dimensional Analysis of a pile foundation with battered piles.
ANCWAL (X0027)	M. Grazioli, NCE /W. Jones, WESKA	CORPS	713-F3F3010	H-635 BCS OPM TSS			Y		Designs anchored bulkhead walls by four soil analysis methods: equivalent beam; free earth support, elastic line (a fixed earth method), and equal moment. Calculates lateral loads resulting from active and passive earth pressures (including wall friction) by Coulomb theory.
BASE SUPPLEMENT TO IMPROVED 3-D PILE	C. Smith, LMS			H-635 CARDIN				N	Uses pile forces output from improved 3-D Pile to calculate moments and shears in base slab.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
BENT1 (I0002)	L. Reese University of Texas, F. Parker, N. Radhakrishnan WESKA	CORPS	713-F3R0014	H-635 TSS BCS			Y		Analysis of group pile behavior by finite difference. University of Texas.
BRIDPL	R. Brittain LMM			H-635 TSS				N	This program uses static pile formulae to determine the minimum bridge pile lengths required to satisfy given safety criteria. The program assumes horizontal soils stratification and a continuous mode which should be familiar to engineers.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
CANPLOT Cantilever Retaining Wall Pile Analysis (Q&S Cases) Considering Uplift (Interactive Graphics Version)	L. Lamarca L. Manson D. Beer L. Manson B. Matherne, LMN		741-F3A2020 NOD Engr # 5K71053 741-X6A2020 NOD Engr # 7K70005	H-635 TSS BCS TSS	X	X	Y		Computes lateral earth forces and overturning moments for each foot of depth along a cantilever retaining wall and balances each to satisfy stability requirements of the method of planes thereby determining the depth of penetration. It then uses the applied lateral earth force, wave force, etc, on the pile to calculate the transverse shear force, bending moment, and deflection (from the undeformed position) at pertinent pile positions. The program can also plot the net pressure, deflection, bending moment diagrams superimposed on the strata lines by means of either an interactive graphics terminal or Calcomp drum plotter.
CANTILEVER RETAINING WALL Q&S CASE (I0007)	M. Lamarca, LMN	CORPS	741-F3A2370	H-635 TSS BCS OPM			Y		Determine the penetration of a cantilever retaining wall or an anchored bulkhead by balancing forces and moments to satisfy stability requirements by the method of planes.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
CANTILEVER RETAINING WALL STABILITY BY THE METHOD OF PLANES (S) CASE, C=ZERO	L. Manson, LMN		741-F3A2120 NOD Engr # 5K71001	H-635 TSS			Y		Cantilever Retaining Wall (also applicable to flood walls) Stability analysis by the method of planes (S) case, C=zero.
CANWAL (X0026)	L. Manson, LMN	CORPS	741-F3A2999	H-635 BCS OPM TSS			Y		Determines the penetration of the Cantilever Retaining Wall by Method of planes. Analyzes the wall as a cantilever beam fixed at the theoretical depth of penetration, and determines shears, bending moments, and deflections per foot of wall.
CCELL (X0040)	R. Mosher W. Jones WESKA	CORPS		BCS		X	Y		A state of practice in the Corps program for analysis/design of circular sheet pile cells founded on rock or soil. It determines or design for the factor of safety of sliding, interlock tension, vertical and horizontal shear, penetration of inboard sheeting (soil), slippage between the sheet pile and cell fill (rock), and pull-out of outboard sheeting.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
CELLRK (X0028)	W. Green R. Warren ORN /W. Jones, WESKA	CORPS	713-F3H3190	H-635 BCS OPM TSS			Y		Computes the following safety factors for circular sheet pile founded on on rock: Sliding; slipping between pile and cell fill; vertical and horizontal shears; and interlock tension.
CELLSL (X0029)	E. Alter, NCB /W. Jones, WESKA	CORPS	713-F3F1050	H-635 BCS OPM TSS			Y		Design of a sheet pile or a parallel wall by the Cumming's Method.
COM62 (I0001)	L. Reese, University of Texas N. Radhakrishnan WESKA	CORPS	713-F3R0018	H-635 BCS OPM TSS		X	Y		Analysis of piles with lateral and axial loads - University of Texas.
CSHTWAL (X0031)	W. Dawkins Oklahoma State University, /W. Jones, WESKA	CORPS	713-F3R0039	H-635 BCS OPM		X	Y		Performs either a design or analysis of an anchored or cantilever sheet pile retaining wall. Uses classical soil mechanics procedures for determining the required depth of penetration of a new wall or assesses the factor of safety of an existing wall.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
CSSIWAL (X0033)	W. Dawkins Oklahoma State University, /W. Jones, WESKA	CORPS	713-F3R0051	H-635 BCS		X	Y		A special purpose program which performs soil-structure interaction analysis of either anchored or cantilever retaining walls. Simplified procedures are incorporated in the program to automatically generate the soil force - displacement characteristics from conventional soil properties.
DUKEFOR	D. Holloway/ H. Taylor, WESGE	ECPL	741-F3R0008	H-635			Y		1D finite element simulation of pile driving and load testing behavior.
HRENNIKOFF PILE ANALSIS WITH SUMMATION OF RESULTS	R. Villarubia, G. Finley, C. Ruckstuhl, & D. Elguezabal LMN		713-F3A2150	H-635 BATCH TSS			Y		Computes actual axial and transverse loads and allowable transverse loads on each pile row for each set of applied forces and moments on a given pile arrangement of a battered pile foundation by the Hrennikoff method.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
LMVDPILE	D. Martin H. Jones N. Radhakrishnan WESKA		713-F3R0026	H-635 TSS	X		Y		This program *is a general* stiffness method of analysis of two- and three-dimensional pile foundations. The pile cap is assumed to be rigid. Deflections and individual pile loads are computed as required by the designer. Adequate representation of the lateral soil-pile interaction is necessary.
MAKE (I0004)	F. Parker N. Radhakrishnan WESKA	CORPS	713-F3R0016	H-635 BCS		X	Y		Generates lateral pressure vs moment curves for piles in sand or clay.
PILE3D (X0014)	T. Mudd, J. Hartman LMS	CORPS	713-F3A3840	H-635 CARDIN	X		Y		3-D load *combination on* 3-D pile foundation with rigid cap. Piles may be battered in any combination of directions. Soil system is averaged into one layer with input value of lateral subgrade *modulus. Multiple* load cases. Variable pile fixity into cap in 3 steps of 0.0 (pinned), 0.5 (flexible), or 1.0 (fixed). (Similar to 713-F3-R0026).

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
PILE CAPACITY COMPUTATIONS	D. Beer K. Broussard LMN		741-F3A2110 NOD Engr # 5K71039	H-635 TSS				X	The program computes the pile bearing capacity which results from cohesion or adhesion and from friction. The pile capacity is computed for a pile in either compression or tension when pile tip is either at the top, middle or bottom of each stratum or at the top or bottom of each stratum and any other elevations selected by the user.
			741-X6A2110 NOD Engr # 7K70007	BCS TSS					
PILES	G. Wardlaw, LMK			TEK4081		X			Performs analysis of single pile using static formulae and interactive input. Allows inclusion or exclusion of resistance in top stratum. Q or S strengths can be used in the top stratum.
PILGPI	M. O'Neil University of Houston, Texas /R. Mosher, WESKD			H-635 BATCH			Y		Computes static load-deformation behavior of pile groups. It uses a "hybrid" model using soil-structure methods for individual piles and theory of elasticity for group effects.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
PX4C3 (I0003)	L. Reese University of Texas, H. Coyle Texas A&M University N. Radhakrishnan WESKA	CORPS	713-F3R0015	H-635 BCS OPM TSS		X	Y		Nonlinear load-settlement characteristic of axially loaded piles (University of Texas).
QPILE	G. Wardlaw, LMK			G-635 TSS CARDIN			Y		Determines pile penetrations for vertical or battered piles in tension or compression with considerations for surcharge pools and piezometric heads. Allows individual analyses of piles under structures using stratified soil data. Uses input data file on TSS Method of analysis is by static formulae.
REDUCE	G. Wardlaw, LMK			TEK4081		X	Y		Reduces the data (strains and deflections) from instrumented test piles. Provides load transfer K factors, end bearing, and elastic deformation data.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
SAPPILE	H. Jones WES	WESLIB		H-635 CARDIN			Y		A modified general purpose structural analysis program (SAP4) with a three-dimensional pile element added: Good for analysis of 3-D flexible cap pile foundations.
TAMFOR	D. Holloway/ H. Taylor, WESGE	ECPL	741-F3R0007	H-635 TSS			Y		Pile driving analysis by the wave equation lumped parameter finite difference method.
WESTTI	T. Hirsch, L. Carr L. Lowery/ H. Taylor, WESGE	ECPL	741-F3R0009	H-635 TSS			Y		The program performs wave equations analysis of pile drivers by a single blow of the hammer. Conventional pile and soil models are used. The program can be used to predict impact stresses in piles during driving and to estimate the static soil resistance on piles at the time of driving.

3. Piles, Sheet Piles & Cells

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
WESWEAP	G. Gable F. Rausche/ H. Taylor, WESGE	ECPL	741-F3R0010	H-635 TSS			Y		The program performs wave equation analysis of piles driven by a single blow of any type of impact hammer. Conventional pile and soil models were used in addition to both a thermodynamic model for diesels and refined mechanical hammer models. The program can be used to predict impact stresses in piles during driving and to estimate static soil resistance on piles at the time of driving.

4. Seepage

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
2-D FEM SEEPAGE PROGRAM	F. Tracy, WESKA	ECPL	704-F3R0245	H-635 BATCH		X	Y		Solves plane and axisymmetric steady-state and transient seepage problems by the finite element method.
3-D FEM SEEPAGE PROGRAM	F. Tracy, WESKA	ECPL	704-F3R0218	H-635 BATCH		X	Y		Solves 3-D steady-state and transient seepage problems by the finite element method.
BERM	G. Wardlaw, LMK			H-437 H-635 TSS TEK4081		X	Y		Design of semipervious seepage berm according to methods presented in WES TM 3-424.
DESIGN FOR INFINITE SYSTEM OF RELIEF WELLS (I0015)	G. L. Cohn A. Ellingson NPS /W. Jones, WESKA	CORPS	741-F3F5050	H-635 OPM BCS TSS			Y		The program determines the relief well spacing for given penetrations into the previous substratum generally as suggested by the WES TM 3-424, Vol. 1. The program computes the factor of safety for the given condition to determine the necessity for relief wells, piezometers or no relief wells. When relief wells are required, the program designs the relief well spacing vs. penetration into the aquifer for conditions with or without a landward top semi-pervious stratum and can compute seepage quantities for the design conditions.

4. Seepage

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS DRUM PLOT	GRAPHICS OPTIONS TEK PLOT	DOCUMENTED YES	DOCUMENTED NO	DESCRIPTION
SEEPBERM	L. Sulzberger LMM			H-635 TSS				N	This program is used to determine the need for landside seepage berms and to design such berms in accordance with guidelines and procedures presented in WES TM No.3-424, "Investigation of Under Seepage and Its Control, Lower Mississippi River Levees", LMV DIVR 1110-1-140, Ch.1, dated 30 November 1976.

5. Stress Computation, Settlement, & Consolidation

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
CBEAR	G. Muster M. O'Neill University of Houston R. Mosher W. Jones M. Pace WESKA	CORPS		H-635 BCS OPM TSS		X	Y		Computes the net bearing capacity of shallow strip rectangular, square, or circular footings on one or two layer soil systems and considers the effects of surcharge, inclined footing base, footing embedment, inclined load, eccentric load (in two directions) submerged soil and inclined soil surface.
FD31 (I0011)	R. Olson Univ. of TX, Austin /R. Mosher, WESKA	CORPS	741-F3R0106	H-635 OPM TSS			Y		The program computes settlement and time-settlement relationships for compressible materials based on Terzaghi's 1-D analysis. The program is only valid for 1-D analysis.
MAGSETII (I0010)	R. Schiffman D. Jubenville V. Partyka Univ. of Colorado /R. Mosher, WESKA	CORPS	741-F3R0105	H-635 OPM TSS			Y		The program utilizes Terzaghi's one-dimensional consolidation theory, simplified to apply to a 2-D condition for estimating settlement in cohesive soils.

5. Stress Computation, Settlement, & Consolidation

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
PROCON	L. D. Johnson WESGE			H-635 BATCH				N	Predicts 1-D consolidation of dredged material and foundation soils. Dredged material placed at variable time intervals.
STRESS	D. Dennis, LMK			TEK4081		X			Analysis program for determining vertical stress induction on irregular shapes.
VERTICAL STRESS INDUCTION (I0008)	L. Manson, LMN	CORPS	741-F3A2540	H-635 BCS OPM TSS			Y		Program employs the superposition of subsections using the principles of the Boussinesq point load Formula for long strip loading (2-dimensional) to determine the influence coefficient for selected position in a subgrade medium.
VERTICAL STRESSES BENEATH EMBANKMENT AND FOOTING LOADINGS (I0016)	D. Spaulding formerly of NCS /R. Mosher WESKA	CORPS	741-F3F5010	H-635 BCS OPM TSS			Y		The program finds vertical stresses for applied structural loadings. Solution method assumes that the foundation material is homogeneous and linearly elastic and that superposition is valid.

5. Stress Computation, Settlement, & Consolidation

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
VERTICAL STRESS INDUCTION AND SETTLEMENT ANALYSIS	J. Flock, M. Pittman, LMN	WESLIB	741-X6A2400 NOD Engr # 8K71001	H-635 BATCH BCS		X	Y		To compute induced vertical stresses within a soil continuum due to a general-shaped imposed surface load using either Westergaard and Boussinesq theory for both two- and three-dimensional analysis. Uses the results for the computation of ultimate and time rate of consolidation.

6. Piezometer Data

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
PIEZOMETER DATA EDIT PROGRAM	J. Montegut, J. Soileau, LMN		732-F3A220A NOD Engr # 6K23007A	H-635 BATCH				N	This program is used to edit and sort input data cards prior to entry into the master file.
PIEZOMETER MASTER FILE UPDATE PROGRAM	J. Soileau, LMN		732-F3A220B NOD Engr # 6K23007B	H-635 BATCH				N	Updates the Piezometer Master File using valid transactions from the edit program as input to update an existing file.
PIEZOMETER DATA EXTRACT PROGRAM	J. Soileau, LMN		732-F3A220C NOD Engr # 6K23007C	H-635 BATCH				N	This program extracts specified data from the Piezometer Master File to be used as input to the Piezometer Plot Program.
PIEZOMETER PLOT PROGRAM	J. Montegut, LMN		732-F3A220D NOD Engr # 6K23007D	H-635 BATCH	X			N	Plots data outputed from extract program (732-F3-A2-20C).
PIEZOMETER AUDIT SUMMARY REPORT	J. Soileau, LMN		732-F3A220E NOD Engr # 6K23007E	H-635 BATCH				N	Prepares report summarizing content of the Piezometer Master File.
PIEZOMETER TABULAR LISTING	J. Soileau, LMN		732-F3A220F NOD Engr # 6K23007F	H-635 BATCH				N	Used to prepare tabular listing of of piezometer readings along w/head-water and tailwater readings.

6. Piezometer Data

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
PIEZOMETER INFORMATION SYSTEM PLOT (CRT VERSION)	J. Soileau, J. Montegut K. Beniot LMN		732-F3A220G NOD Engr # 5K23005	H-635 TSS		X		N	Generates a plot of piezometer, headwater, & tailwater elevations vs. dates the data was recorded on an interactive graphics display terminal.
PIEZOMETER PROFILE EXTRACT	P. Winterfield, LMN		732-F3A220H NOD Engr # 6K23007H	H-635 BATCH				N	Extract data from Piezometer Info System tape & write data onto disk for use w/Piezometer Profile Plot.
PIEZOMETER PROFILE PLOT	P. Winterfield, LMN		732-F3A220I NOD Engr # 6K230071	H-635 BATCH	X			N	Used to graphically display piezometer water surface profiles.
PIEZOMETER CHANGE FOR TOR, WSE, HW, & TW	P. Winterfield, J. Soileau, LMN		732-F3A220J NOD Engr # 6K23007J	H-635 BATCH	X			N	Used to search the piezometer master tape to find a specific piezometer and between specific dates have the ability to change (by adding numerically) either, or all, of the elevation records representing top of riser (TOR), water surface surface elevation (WSE), in the riser; headwater (HW) and tailwater elevations (TW).

6. Piezometer Data

PROGRAM NAME	AUTHOR/CONTACT	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
SDMS	B. Fithen L. Guice C. Schroeder Louisiana Tech University /G. Wardlaw, LMK					X	Y		Sequential data management system for piezometer data. It has a structured form for the storage, recall, and display of piezometer data.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
CHART1	R. Leach, WESGE			H-635 TSS			Y		Increments by sequential numbers all dates following an initial date.
CONSOLID	A. Park, WESGE			H-635 TSS	X			N	Data reduction/plot program for consolidation tests. Input items are taken directly from Eng Form 3847 and 3848. Output includes E-LOG-P and TIME-CONSOLIDATION plots. User instructions are available.
D.SHEAR	A. Park, WESGE			H-635 TSS	X			N	Data reduction/plot program for direct shear tests. Data sheets and input format are available.
DIGINC1 (Slope Inclinometer Program)	R. Leach, WESGE (revised by Baltimore Dist.)			H-635 TSS			Y		This program reduces data from the Digitilt Slope Indicator and the Hall Inclo-Meter and tabulates the degree of deflection at various intervals along the casing so that any lateral movement in slopes or embankments can be documented and monitored. The program also provides deflection versus depth for various scales.
DIGING	R. Leach, WESGE			H-635 TSS	X		Y		Reduces and plots inclinometer data from the Digitilt and Hall.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
DIGIT8	G. Wardlaw, LMK		741-G1A4040	TEK4081		X	Y		An interactive data reduction program used to reduce data from the Slope Indicator Mag Tape Reader, Vertical Slope Pipes.
DIGITAPE	W. Bereswill LMS			H-635 TSS			Y		To convert inclinometer data, recorded on tape in the field, to a format which will allow for further reduction.
DIGITH	W. Forrest, LMK			TEK4081		X	Y		An interactive data reduction program used to reduce data from the Slope Indicator Mag Tape Reader, Horizontal Slope Pipes.
DS.CHECK	A. Park, WESGE			H-635 TSS				N	This program is to "check" an input data file for the D.SHEAR program listed above. The purpose of the program is an attempt to flag input typing errors.
GEODOLITE REDUCTION	B. Kleber, LMS			TEK4051		X		N	Reduces trilateration survey data. Data recorded in the field using electronic distance measuring equipment.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
GRAV	A. Park, WESGE			H-635 TSS				N	TSS program to compute specific gravities in sets.
INCLINOMETER COMPRESS I	J. Jobst, LMS	A3LIB	741-F3A320D	H-635 BATCH			Y		Extracts inclinometer identification information for each data set on the tape as well as the relative position on the tape and writes this information to a data file.
INCLINOMETER COMPRESS II	J. Jobst, LMS	A3LIB	741-F3A320E	H-635 BATCH			Y		Extracts the most recent inclinometer data sets on the tape, based on an index file, and writes them to a new tape.
INCLINOMETER PRODUCTION RUN	J. Jobst, LMS	A3LIB	741-F3A320A	H-635 BATCH	X		Y		Calculates deflection profiles of various holes for desired set of data, compares initial/final profiles and plots the changes in deflection.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
INCLINOMETER SLOPE/SPAWN	J. Jobst, LMS	A3LIB	741-F3A320C	H-635 TSS			Y		Reduces inclinometer data. Program constructs control cards and input files for programs 741-20A and 20B and spawns batch job.
INCLINOMETER SORT	J. Jobst, LMS	A3LIB	741-F3A320F	H-635 BATCH			Y		Sorts inclinometer data set information and squeezed out duplicate set ID's based on positional information.
INCLINOMETER UPDATE	J. Jobst, LMS		741-F3A320B	H-635 BATCH			Y		Merges old historical inclinometer data tape with current readings to give updated historical tape.
INSTRUMENTATION BUBLENTR	G. Willick LMS			H-635 TSS			Y		Allows T/S entry of instrumentation data generated off line on a Texas Instruments Teletype with a bubble memory.
INSTRUMENTATION COPY-TAPE	J. Jobst, LMS		741-F3A317T	H-635 BATCH			Y		Routine to create a copy of a data tape.
INSTRUMENTATION CUT-OFF	J. Jobst, LMS		741-F3A317Y	H-635 BATCH			Y		Routine to update a historical data tape by deleting records before a specified cutoff date.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
INSTRUMENTATION DATA REDUCTION	G. Willick, LMS	A3LIB	741-F3A3170	H-635 BATCH	X		Y		Reduces field data from several different types of data.
INSTRUMENTATION DATAENTR	W. Bereswill, LMS		741-F3A317D	H-635 TSS			Y		Allows interactive entry of field readings of instrumentation data.
INSTRUMENTATION DIGITIZER	G. Willick, LMS		741-K4A317G	TEK4051 (TEK4907) (TEK4952)		X	Y		Allows digitizing of constant plate data.
INSTRUMENTATION PLOT DRIVER	G. Willick, LMS		741-K4A317P	TEK4051 (TEK4907) (TEK4662)		X	Y		Converts the pseudo plot commands into a format meaningful to the Tektronix mini computer and to execute these plot commands.
INSTRUMENTATION PLOT EDITOR	G. Willick, LMS		741-K4A317E	TEK4051		X		N	Allows user to manipulate and edit the pseudo plot files.
INSTRUMENTATION PLOTSYS/ SPAWN	G. Willick, LMS		741-F3A317R	H-635 TSS	X	X	Y		Assists user in running 741-170 series programs (170, 17B, 17C). Quizzes user for information needed to run the job, sets up the proper JCL, and spawns a batch job.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
INSTRUMENTATION PSEUDO PLOT	G. Willick, LMS	A3LIB	741-F3A317F	H-635 BATCH			Y		Reduces instrumentation data in a format acceptable for plotting on the TK 4051 computer.
INSTRUMENTATION PULL BACK	G. Willick, LMS		741-K4A317I	TEK4051 H-635 (TEK4907)		X	Y		Assists user in retrieving plot files from H-635 and storing them on 4051 storage device.
INSTRUMENTATION TAPEHDL/ SPAWN	G. Willick, LMS			H-635 TSS			Y		Assists user in running utility programs, for manipulation of data tapes. Quizzes user for information needed to run the job. Set up proper JCL, and spawns a batch job.
INSTRUMENTATION TAPEIN	J. Jobst, LMS		741-F3A317N	H-635 BATCH			Y		Routine to convert a BCD tape to an ASCII timesharing file. Allows user to access a copy of his data via T/S.
INSTRUMENTATION TLIST	J. Jobst, LMS		741-F3A317L	H-635 BATCH			Y		Routine to list a data tape.
INSTRUMENTATION TSORT	J. Jobst, LMS		741-F3A317S	H-635 BATCH			Y		Routine to sort a data tape by instrument type and reading data.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
INSTRUMENTATION UPDATE	G. Willick, LMS	A3LIB	741-F3A317B	H-635 BATCH			Y		Updates and edits historical instrumentation data tapes.
JNMTR	R. Leach, WESGE			H-635 TSS			Y		Reduces joint meter data.
MAG-DIAG	R. Singleton, LMS			H-635 TSS			Y		To diagnose inclinometer readings which were recorded on magnetic tape in the field.
PPCELL	R. Leach, WESGE			H-635 TSS			Y		Reduces pore pressure cell data.
QU.CHECK	A. Park, WESGE			H-635 TSS				N	This program is used to "check" an input data file for the QU.DRAFT and QU.PLOT programs listed below. The purpose of the program is an attempt to flag errors in the input data before test results are presented. Input formats, data sheet, and run instructions are available.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
QU.DRAFT	A. Park, WESGE			H-635 TSS				N	Data reduction program with tabulated output for the Q and Uc triaxial soils test. This program is used to transmit draft and/or final data to the districts and others as soon as testing is finished. See also QU.CHECK above.
QU.PLOT	A. Park, WESGE			H-635 TSS	X			N	Data reduction/plot program for the Q and Uc triaxial tests. Output sheet features stress-strain plot, Mohr's circles, failure sketches, and time to failure computations. See also QU.CHECK and QU.DRAFT above.
R-TRIAX	A. Park, WESGE			H-635 TSS				N	Data reduction program for the R/R-BAR triaxial test with tabulated output. Data sheets and run instructions are available.
SIEVE	T. Wolff, LMS			BCS TSS				N	From input of weights retained on 5 or 6 standard sieves, program computes percentages passing and retained, classifies material type and gradation, and estimates D_{10} size.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
SIEVES	A. Park, WESGE			H-635 TSS	X			N	Data reduction/plot program for grain size analysis. The program uses sieve weights, hydrometer reading, and data codes to produce percent finer plots. Data sheets, input formats and run instructions are available.
SLOPE INCLINOMETER DATA SYSTEM-EXTRACT	P. Winterfield, LMN		741-F3A2570 NOD Engr # 6K74003C	H-635 BATCH	X			N	This program will perform extract requests from the systems master data tape, convert the data to depths in feet and deflections in inches and write this information to a quick-access disc file in a format suitable for use with the slope inclinometer plot program.
SM200B	J. Palmerton, WESGR			H-635 TSS			Y		Reduces and plots inclinometer data from the 200B and Soiltest C350.
SNMTR	R. Leach, WESGE			H-635 TSS			Y		Reduces strain meter data.
SNTOSS	C. Trahan, LMV			H-635 TSS			Y		Calculates concrete stress from strain meter data.

7. Instrumentation & Laboratory Data

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
SSMTR	R. Leach, WESGE			H-635 TSS			Y		Reduces stress meter data.
TESTING	T. Wolff, LMS			BCS TSS		X		N	Program sorts a data file of all types of shear testing. Data can be sorted on boring No., sample No., duration, soil type, test type, formation and/or confining stress. Data found in sort can be listed and/or plotted (Mohr's circles, S envelope, deviator stress vs moisture content).
TWISP	R. Leach, WESGE			H-635 TSS			Y		Reduces twist data from Sinco Spiral Checking Device.

8. Plotting Programs

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
BORING LOG PLOT	T. Wolff, LMS		803-G1A3430	GE-225 BATCH	X		Y		Batch program to plot boring logs, one per sheet on 14 x 21 inch sheets.
BORPLOT	L. Manson, LMN			GE 225 H-635 BATCH	Flat-bed		Y		The program provides a plot of the schematic representation of the results of soil and rocks exploration of borings or test pits, with the various soil or rocks encountered shown by their appropriate symbols. The program was written to standardize the schematic representation of soil materials by conforming to symbols of the Unified Soil Classification System and the rock symbols standardized by the U. S. Geological Survey. The program is a quick, accurate method for plotting general and undisturbed type boring logs and for achieving and maintaining a consistency in presenting graphic representation of soil and rock data throughout the Corps of Engineers.
CARDP	L. Sulzberger LMM	A1B100		H-635 TSS CARDIN				N	Punches cards for Boring Log Plot Program.

8. Plotting Programs

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
COMPACT-I	J. Jobst, LMS		741-X6A340I	BCS TSS		X	Y		An interactive graphics program for the compilation and display of impervious or semi-pervious soil compaction control data.
COMPACT-P	J. Lee J. Williams LMS		741-X6A340P	BCS TSS		X	Y		An interactive graphics program for compilation and display of pervious soil compaction control data.
GENERAL TYPE BORING LOG PLOT, MOD 7	L. Manson M. Lamarca LMN	WESLIB	741-F3A2230 NOD Engr # 6K71001	H-635 BATCH	X		Y		To plot a graphic representation of General Type soil and rock symbol and either the water content, stratum change, D_{10} grain size, consistency, color, modification symbols and penetration or a variable input description of the physical properties of soil or rock may be plotted.
GROUT X	J. Jobst, LMS			BCS TSS		X		N	An interactive graphics program for reading grouting data stored in a disk file and displaying bar charts and data plots as selected from a menu list.

8. Plotting Programs

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
RUNVER	G. Wardlaw LMK		741-F3A4130	G-635 CARDIN	X		Y		Plots up to 12 sets of reading for slope indicator casings. Plot is on standard DM size plate with a symbol-data legend. Uses TSS input data file.
UNDISTURBED BORING LOG PLOT WITH GRID	L. Manson M. Lamarca LMN	WESLIB	741-F3A2240 NOD Engr # 6K71003	H-635 BATCH	X		Y		Plots a graphic representation of undisturbed type soil boring logs, and to plot the data grid, plasticity chart shear strength data charts, and consolidation data grid which may consist of two three or four cycle log grids. The soil symbols, stratum changes, penetration resistances, D_{10} sizes consistencies, and modification symbols can be plotted on the log.

9. Finite Element Method/Finite Difference

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
3D FE DATA EDIT	F. Tracy, WESKA A. Wade, WESKP	ECPL	704-F3R0219	H-635 TSS BATCH	X	X	Y		This program plots a 3-D finite element (FE) grid using as input the data cards for either the SAP5 or 3-D Seepage FE analysis programs. The FE grid can be plotted with hidden lines deleted or all lines The picture can also be rotated for obtaining different views.
AXISYM	D. Holloway /H. Taylor, WESGE	ECPL	713-F3R030	H-635 BATCH			Y		Axisymmetric finite element code verified for analysis of one pile-soil interaction problem.
BICAR	Shell Oil Company/W. Barker WESGF	ECPL	713-F3R0053	H-635			Y		A general-purpose program for computing stresses, strains, and displacements in elastic multilayered systems subjected to one or more uniform loads, acting uniformly over circular surface area. These surface loads can be combinations of a vertical normal stress and a undirectional tangential stress.
BMCOL (X0032)	Prof. Matlock University of Texas N. Radhakrishnan WESKA	CORPS	713-F3R0050	H-635 CARDIN	X		Y		Finite difference program to solve a variety of simple and complex beam-column structural problems accounting for movable loads - University of Texas.

9. Finite Element Method/Finite Difference

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
CBCSSI (X0060)	W. Dawkins, Oklahoma State University /W. Jones, R. Mosher, WESKA	CORPS		BCS OPM TSS		X	Y		A general purpose soil-structure interaction analysis program for beam-columns, axially loaded piles, and sheet pile walls. It uses the finite element method with 1-D beam element for the structural components on fixed supports, nonlinear and/or linear concentrated and/or distributed spring supports. The program is divided into three subprograms: 1. CBEAMC - for the general beam-column analysis; 2. AXPILE - for the analysis of axially loaded piles; 3. SHTSSI - for the SSI analysis of sheet pile walls.
CHEVIT	Chevron Oil Company, modified by Y. Chou, WESGP			H-635 CARDIN			Y		Program computes closed form solution of stresses, strain and displacements of elastic layered soil systems.
FEMWIL	E. Wilson University of California, Berkeley N. Radhakrishnan WESKA	ECPL WESLIB	713-F3R0013	H-635 TSS			Y		Finite element analysis of plane stress structures. Computes stresses and deformations. (University of California).

9. Finite Element Method/Finite Difference

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
FESS41	N. Radhakrishnan WESKA	ECPL WESLIB	714-F3R010A	H-635 TSS CARDIN			Y		Finite element method is used to compute stresses and deformations in soil in plane strain geometry. Program takes into account nonlinear behavior of soil systems.
FESS412	N. Radhakrishnan WESKA	ECPL WESLIB	713-F3-R010B	H-635 CARDIN			Y		Stresses and deformations in soil masses in axisymmetric or plane strain geometry. Soil system non-linearity included via incremental-iterative technique - modeling from nonlinear stress-strain fitted in a hyperbolic form for both the shear modulus and Poisson's ratio.
GPOSTFEM	F. Tracy, WESKA	ECPL	704-F3R0005	H-635 TSS		X	Y		An interactive graphics program for post-processing finite element data. Program can generate contour plots, vector plots, isometric and perspective plots.
GPREFEM	F. Tracy, WESKA	ECPL	704-F3R0006	H-635 TSS		X	Y		Pre-processing finite element program. An interactive graphics program for automatically generating finite element grids with on-line data editing.

9. Finite Element Method/Finite Difference

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
H51	General Dynamics Company /W. Barker, WESGF	ECPL	713-F3R0052	H-635 CARDIN			Y		A computerized analysis for graphical solution of Westergaard equations of bending for thin slabs on a Winkler foundation (Edge Load Case). Computes block count (Pickett & Ray influence Chart #6), bending moment and stress at slab edge in a direction parallel to edge.
HEAVE	L. Johnson, WESGE			H-635 TSS			Y		Predicts heave check of expansive foundation soils by 2-D finite difference formulation.
ISBILD	Y. Ozawa J. M. Duncan /W. Jones, WESKA	ECPL	741-F3R0071	H-635 BATCH			Y		A computer program for analysis of static stresses and movements in a graphical pre-processor program to generate using the non-linear incremental finite element method.
GISB	J. Jones, NPA W. Jones, WESKA	ECPL	741-F3R0070	H-635 TSS		X	Y		To interactively prepare data for the FEM embankment analysis program ISBILD. Display or generate input geometry and make modifications.

9. Finite Element Method/Finite Difference

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
MATLOCKM	J. Hartman, LMS/W. Jones, WESKA			H-635 CARDIN	Y		Y		Determines maximum positive and negative moments, shear displacements and reactions at each location on a beam for any set of vertical load moved incrementally along the length. Modified version of BMCOL for moving loads.
PRESAP	W. Jones, WESKA	WESLIB		H-635 TSS			Y		An interactive time-sharing program to generate data for the General Purpose Structural Analysis Program (SAP4).
SOLSAP	J. Palmerton WESGR			H-635 BATCH			Y		An extension of the 3-D general purpose program SAP which can account for nonlinear soil properties. Program also simulates incremental construction.

10. Earthquakes & Dynamics

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
CHAR2D	B. Wylie University of Michigan /W. Deer, WESGH			H-635 BATCH			Y		2-D latticework model for wave propagation by method of characteristics.
CHARSOIL	B. Wylie University of Michigan /W. Deer, WESGH			H-635 BATCH			Y		1-D wave propagation by method of characteristics.
EQCYCLE	K. Lee University of California, Los Angeles, /W. Deer, WESGH			H-635 BATCH			Y		Processing of stress-time histories for equivalent uniform cycles.
LUSH2	J. Lysmer University of California, Berkeley /W. Deer, WESGH			H-635 BATCH			Y		2-D equivalent - linear dynamic code (frequent domain) for earthquakes.

10. Earthquakes & Dynamics

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
QUAD4	I. Idriss, J. Lysmer R. Hwang H. Seed University of California, Berkeley /W. Deer, WESGH			H-635 BATCH			Y		2-D equivalent - linear dynamic code for earthquake.
SHAKE2	J. Lysmer P. Schnabel, H. Seed University of California, Berkeley /W. Deer, WESGH	ECPL	741-F3R0005	H-635 BATCH			Y		1-D vertical wave propagation code for earthquake.
SPECEQ	P. Jennings California Institute of Technology /W. Deer, WESGH			H-635 BATCH			Y		Generates response spectra for time histories.

11. Others

PROGRAM NAME	AUTHOR/CONTACT OFFICE	LIBRARY	PROGRAM NUMBER	COMPUTER/ MODE	GRAPHICS OPTIONS		DOCUMENTED		DESCRIPTION
					DRUM PLOT	TEK PLOT	YES	NO	
HIDDEN	F. Tracy, WESKA	WESLIB		H-635 TSS		X	Y		Solves the 3-D hidden surface algorithm.
MENARD	G. Baladi, WESSD			H-635 TSS				N	Calculates the distribution of stresses and displacements in an elastic transverse isotropic medium due to normal loading on the surface of a cylindrical cavity whose axis of symmetry is inclined to the plane of isotropy.

PART III: ABSTRACTS

1. T-Walls

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
TWDA - T-Wall Design Analysis (CORPS No. X0053)	713-F3-R0-027

PREPARING AGENCY
U. S. Army Engineer Waterways Experiment Station, ADP Center, CADG

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
William A. Price, Robert L. Hall, Reed L. Mosher, H. Jones & M. George	June 1980	Operational	

A. PURPOSE OF PROGRAM

Analysis or design of an inverted-T wall subjected to retaining wall and/or floodwall loadings. Design comparisons for finding the most economical combination of base embedment, key length, base width, and base slope are based on construction cost of excavation, concrete, and backfill. Performs stability analysis or design and structural analysis or design. Conforms to Engineer Manual 1110-2-2501, EM 1110-2-2505, and other Corps of Engineers standards.

B. PROGRAM SPECIFICATIONS

The program is written in FORTRAN IV. The graphics display option uses the Graphics Compatibility System (GCS).

C. METHODS

Active earth pressures may be calculated by Coulomb's equations or by the incremental wedge method. The program is highly interactive, following a computer-aided design methodology. The analysis procedure considers overturning, sliding, and bearing pressure, relative to the soil immediately adjacent to the wall. Earthquake effects are included. Stress design includes determination of reinforcement.

D. EQUIPMENT DETAILS

Time-sharing mainframe computer (overlaid for 49k words of main memory).

Time-sharing terminal - Tektronix 4014 needed for graphic display option. Rest of program may be run on any interactive terminal.

Remote high-speed job entry terminal (COPE, etc.)

E. INPUT-OUTPUT

Input is by time-sharing keyboard, either directly or via data files. Intermediate data are stored in disc files. Output is to the time-sharing terminal and/or to a high-speed computer terminal.

F. ADDITIONAL REMARKS This program was written under the auspices of the OCE Computer-Aided Structural Engineering (CASE) Project Task Group on T-Walls and the LMVD Computer-Aided Structural Design (CASD) Committee. Call W. A. Price, FTS: 542-3645, for more information. Available publications include the Basic User's Guide, the User's Reference Manual, and the Program Validation Manual. They are available from the ECPL of the WES Technical Information Center. Documentation of the program specifications is available from LMVD.

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

2. Slope Stability

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
MASTER STABILITY ANALYSIS	741-X6-A2-520

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
L.H. Manson, converted to Boeing Computer Services by K. Broussard	Oct 1978	Mod 2	Aug 1978

A. PURPOSE OF PROGRAM

The program performs the stability analysis used to help determine the critical profile of any natural or man-made earth slope embankment for which shear failure could occur along a surface approximated by a series of planes. It uses the wedge method of stability analysis to design either a minimum section, berm, or revetment foundation thru an iterative procedure.

B. PROGRAM SPECIFICATIONS The program is written in the CYBER 175 FORTRAN Extended language. The program is limited to a maximum of 16 profiles with 47 coordinates each. Cohesion at the center and bottom of each stratum and the unit weight for each stratum can vary horizontally and linearly between two boring locations. The assumed failure surface is a combination of active and passive wedges with the central sliding block chosen to conform to stratification which does not have to be horizontal. The program is designed so the user may check any stratum or any elevation within that stratum.

C. METHODS The program uses an iterative procedure to help determine the critical profile. The program uses the Method of Wedges in which soil mass is divided into three segments: an active wedge, a central block, and a passive wedge. The assumed failure plane for the active and passive wedges are inclined $45°-\emptyset/2$ and $45°+\emptyset/2$, respectively, with the vertical boundaries assumed at the central block. The forces on each segment are considered separately. The factor of safety is computed with respect to the shear strength of the soils and is the summation of horizontal resisting forces (RA+RB+RP) divided by the summation of the horizontal driving forces (DA+DB-DP).

D. EQUIPMENT DETAILS

The program requires a computer system similar to the Boeing Computer Services' CYBER 175 system and is executed from a low speed remote data terminal.

E. INPUT-OUTPUT Input is: Code for type of analysis: regular stability, stability with berm, revetment analysis (1 set strengths) or (2 set strengths); boring locations, safety factor, coordinates of start of slope cut, starting slope; soil properties: friction angle, unit weight, cohesion at center and bottom of each stratum; Cartesian coordinates of defining stratum profile points; active and passive wedge info and options for strata checked. Output consists of the complete driving and resistance forces and safety factor for wedge locations checked.

F. ADDITIONAL REMARKS

NOD Engineering ID No. - 7K70003

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2063 WHICH IS OBSOLETE

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
I0013 - Slip Circle Slope Stability With Side Forces	741-T1-F5030

PREPARING AGENCY
Waterways Experiment Station, ADP Center

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
D. A. Spaulding St. Paul District			

A. PURPOSE OF PROGRAM

Performs Slip Circle Slope Stability calculations with side forces.

B. PROGRAM SPECIFICATIONS

Timesharing Program.

C. METHODS

Performs slip circle slope stability calculations on embankment or natural slopes in accordance with EM 1110-2-1902, draft Feb. 1968. The program calculates the factor of safety against sliding for a series of trial arcs tangent to a horizontal plane, and locates the circle with the minimum factor of safety.

D. EQUIPMENT DETAILS

Low speed terminal, Central Processor

E. INPUT - OUTPUT

Input may be entered interactively from terminal or read from a previously prepared data file.

Output may come directly back to terminal or be stored in a file to be listed later.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA., Boeing Computer Services CYBER 175, HIS Datanetwork.

ENG FORM 1 AUG 60 2883

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Slope Stability Analysis by the Method of Wedges (I0006)	741-F3-A2160

PREPARING AGENCY
U. S. Army Engineer District, New Orleans

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Author: L. H. Manson Adapted for CORPS - WES ADPC	Written - 1974 Adapted - 1974	COMPLETE	

A. PURPOSE OF PROGRAM

Determines the factor of safety of any embankment or slope.

B. PROGRAM SPECIFICATIONS

FORTRAN - Time-sharing program.

C. METHODS

Program uses the method of Wedges in which the soil mass is divided into three segments: an active wedge, a central block, and a passive wedge. Vertical boundaries are assumed between the central block and the active and passive wedges, and the forces on each segment are considered separately. The computed factor of safety with respect to the shear strength of the soils is shown in this general form: F.S.=RA+RB+RP/DA-DP, such that the summation of the resisting forces divided by the summation of the driving equals the Factor of Safety.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT-OUTPUT

Input may be entered from a free-field prepared data file or interactively at execute time.

Output will come directly back tc the terminal or directed to an output file.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

DAEN FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
SLOPE STABILITY ANALYSIS WITH PLOT ROUTINES	741-X6-A2-17A

PREPARING AGENCY
U. S. Army Engineer, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
L.H. Manson; modified by J. Montegut & P. Oakland; converted to Boeing Computer Services by K. Broussard	September 1978	Mod 2	Aug 1978

A. PURPOSE OF PROGRAM

The program determines the factor of safety using stability analysis by the method of wedges on any embankment or slope. In addition, the program outputs the data required to generate a Calcomp 925/1036 drum plot of the stability analysis plate from program 741-X6-A2-17B.

B. PROGRAM SPECIFICATIONS

The program is written in the CYBER 175 FORTRAN Extended language.

C. METHODS The Program uses the method of wedges in which the soil mass is divided into three segments: An active wedge, a central block, and a passive wedge. Vertical boundaries are assumed between the "central block" & the active & passive wedges, and the forces on each segment are considered separately. The computed factor of safety with respect ot the shear strength of the soils is shown in this general form: F.S. = RA+RB+RP/DA-DP, such that the summation of the resisting forces divided by the summation of the driving equals the factor of safety.

D. EQUIPMENT DETAILS

The program requires a computer system similar to the Boeing Computer Services' CYBER 175 timesharing system and is executed from a low speed remote data terminal.

E. INPUT-OUTPUT

INPUT: Data File is broken down into 7 types: TYPE 1-Job Number, Date. TYPE 2-Job Name, Etc. TYPE 3-Total Number of Strata and Boring Locations. TYPE 4-Friction Angle, Effective unit weight of the Soil, Average Cohesion and Unit Cohesion. TYPE 5-Coordinates for the Profiles. TYPE 6-Number of the Stratum being Analyzed, Elevation, and Active Wedge Range. TYPE 7-Location of Passive Wedges.

F. ADDITIONAL REMARKS

NOD Engineering ID Number: 8K70001

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
SLOPE STABILITY ANALYSIS WITH PLOT ROUTINES	741-F3-A2-17A

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
L.H. Manson; modified by J. Montegut & P. Oakland; converted to Boeing Computer Service	September 1978	Mod 2	Aug 1978

A. PURPOSE OF PROGRAM

The program determines the factor of safety using stability analysis by the method of wedges on any embankment or slope. In addition, the program outputs the data required to generate a Calcomp 925/1036 drum plot of the stability analysis plate from program 741-X6-A2-17B.

B. PROGRAM SPECIFICATIONS

The program is written in the CYBER 175 FORTRAN Extended language.

C. METHODS

The Program uses the method of wedges in which the soil mass is divided into three segments: An active wedge, a central block, and a passive wedge. Vertical boundaries are assumed between the "central block" & the active & passive wedges, and the forces on each segment are considered separately. The computed factor of safety with respect to the shear strength of the soils is shown in this general form: F.S. = RA+RB+RP/DA-DP, such that the summation of the resisting forces divided by the summation of the driving equals the factor of safety.

D. EQUIPMENT DETAILS

The program requires a computer system similar to the Boeing Computer Services' CYBER 175 timesharing system and is executed from a low speed remote data terminal.

E. INPUT-OUTPUT

INPUT: Data File is broken down into 7 TYPES. TYPE 1-Job Number, Date, Etc., TYPE 2-Job Name, Etc., TYPE 3-Total Number of Strata and Boring Locations. TYPE 4-Friction Angle, Effective unit weight of the Soil, Average Cohesion and Unit Cohesion. TYPE 5-Coordinates for the Profiles. TYPE 6-Number of the Stratum being Analyzed, Elevation, and Active Wedge Range. TYPE 7-Location of Passive Wedges.

F. ADDITIONAL REMARKS

WES FORM 1 JUL 80 2205

REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
SLOPE STABILITY ANALYSIS PLOT	741-F3-A2-17B

PREPARING AGENCY

USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
L. H. Manson; converted to WES G-635 by, J. A. Montegut, III	Feb 1977	Mod 1	Feb 77

A. PURPOSE OF PROGRAM

The Program plots a final plate which contains a levee or embankment cross section, the soil stratification, the active and passive wedges analyzed, and soil properties of each stratum. A tabular listing of the wedges that are analyzed and their corresponding driving forces, resisting forces, summations of forces and factors of safety, a title block, definitions of the symbols that are used, and variable general notes are also plotted.

B. PROGRAM SPECIFICATIONS

The program is written in the Honeywell Series 600/6000 FORTRAN.

C. METHODS

The program reads the information necessary for plotting from a Disc file created by Program Number 741-F3-A2-17A. It then plots the section in the format specified in part E.

D. EQUIPMENT DETAILS

One remote job entry terminal which can access a Honeywell Information System G-635 Computer System with Disc a tape capabilities, and a Calcomp Drum Plotter Model 925/1036.

E. INPUT-OUTPUT

INPUT: Is by means of a disc file which contains vertical and horizontal scale & page sizing factors, project identification information, soil characteristic of each stratum (friction angle, effective unit weight, average & unit cohesions, & a soil type symbol), coordinate of each profile, & active & passive wedge locations with their respective driving and resisting forces and factors of safety.

PRINTED OUTPUT: Wedge Coordinate Listing. PLOTTED OUTPUT: Magnetic Tape which contains the border, title block and title, stratified section, horizontal and vertical staffs, active and passive wedges, resisting and driving forces, summation of forces, factors of safety, friction angles, effective unit weights of the soils, average & unit cohesions, soil types and descriptive notes.

F. ADDITIONAL REMARKS

Engineering Division ID: No. 6K71007

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
I0014 - Slope Stability Using Generalized Failures Surface	741-F5-F020

PREPARING AGENCY
USAE Waterways Experiment Station, ADP Center

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Douglas Spaulding St. Paul District	Sep 1972		OP

A. PURPOSE OF PROGRAM

Performs slope stability calculations on embankments or partial slopes in accordance with EM 1110-2-1902, April 1970.

B. PROGRAM SPECIFICATIONS

Timesharing Program.

C. METHODS

Performs slope stability calculations om embankment or natural slopes in accordance with EM 1110-2-1902, April 1970. Calculates factors of safety for failure surfaces defined by (1) a series of up to 50 straight line segments or (2) an upslope wedge, network block and downslope wedge. Will minimize factor for failure surfaces described by method 2.

D. EQUIPMENT DETAILS

Low speed terminal, Central processor.

E. INPUT-OUTPUT

Input may be entered interactively from terminal or read from a previously prepared data file.

Output may come directly back to terminal or be stored in a file to be listed later.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA., or Boeing Computer Services, CDC equipment.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Analysis of Slope Stability (The Circular Arc Method)	741-F3-R0003

PREPARING AGENCY: Automatic Data Processing Center, U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
James B. Cheek, Jr.	May 1974		Op

A. PURPOSE OF PROGRAM

The program is intended to have general application in providing the safety analysis of any natural or man-made earth slope for which the circular-arc method is valid.

B. PROGRAM SPECIFICATIONS

Program is written in FORTRAN IV.

C. METHODS

The program performs the embankment stability computations using the circular-arc method of analysis for finite slices described in EM 1110-2-1902 dated 27 December 1960. Further details on the method of solution are presented in WES MP K-73-2 dated March 1973.

D. EQUIPMENT DETAILS

Program is for GE 635 computer W/disc drives and time-sharing system, accessed via teletype terminal.

E. INPUT-OUTPUT

SEE REVERSE

F. ADDITIONAL REMARKS

ENG FORM 2883 1 AUG 68 PREVIOUS EDITIONS ARE OBSOLETE.

E. Input-Output

Input data consist of the X,Y coordinates of the soil and seepage line profile; cohesion and friction angle for each soil from the Q,R, and S strength tests, high and low elevations (for the drawdown computations); arc center and radius data define each arc for which safety analyses are to be made. Input data are stored on disc under a new file supplied by the user. The data file is initially built by the user supplying the required data during execution of program; subsequent runs may use previously defined data. Output consists of tabulation safety factors for normal and earthquake loading. Output is printed at the terminal.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Analysis of Slope Stability (Wedge Method) - SSW028	741-F3-R0028

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, Miss. 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
James B. Cheek, Jr. Robert L. Hall	June 1975		OP

A. PURPOSE OF PROGRAM

The program is intended to have general application in providing the safety analysis of any natural or man-made earth slope for which the wedge method is valid.

B. PROGRAM SPECIFICATIONS

Program is written in FORTRAN IV.

C. METHODS

The program performs the embankment stability computations using the Lower Mississippi Valley Division's procedure for the wedge method of analysis.

D. EQUIPMENT DETAILS

Program is for G-635 computer W/disc drives and time-sharing system, accessed via teletype terminal.

E. INPUT-OUTPUT

Input data consists of the X,Y coordinates of the soil and seepage line profile; cohesion and friction angle for each soil from the Q,R, and S strength tests, pool evaluations for draw-down and seepage computations; and the X,Y coordinates for each end of neutral block. Data may be prepared beforehand and stored in a computer file or supplied from the terminal during execution. Restart capability is provided. Output consists of tabulation safety factors for normal and earthquake loading. Output is printed at the terminal.

F. ADDITIONAL REMARKS

ERD FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	Analysis of Slope Stability, Wedge Method with Excess Pore Water Pressures (SSW039)	PROGRAM NO. 741-F3-R0039
PREPARING AGENCY	U.S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, Miss. 39180.	

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
James B. Cheek, Jr.	March 1974		OP

A. PURPOSE OF PROGRAM

The program is intended to have general application in providing the safety analysis of any natural or man-made earth slope for which the wedge method with excess pore water pressure is valid.

B. PROGRAM SPECIFICATIONS

Program is written in FORTRAN IV.

C. METHODS

The program performs the embankment stability computations using the Lower Mississippi Valley Division's procedure for the wedge method of analysis. Further details on the method of solution are presented in WES K-74-2 dated March 1974.

D. EQUIPMENT DETAILS

Program is for G-635 computer W/disc drives and time-sharing system, accessed via teletype terminal.

E. INPUT-OUTPUT

Input data consists of the X,Y coordinates of the soil profiles point; cohesion and friction angle for each soil from the Q,R, and S strength tests; pore pressure at interior points; and the X,Y coordinates of each end of neutral block. Data may be prepared beforehand and stored in a computer file or supplied from the terminal during execution. Restart capability is provided. Output consists of tabulation safety factors for normal and earthquake loading. Output is printed at the terminal.

F. ADDITIONAL REMARKS

DDC FORM 1 AUG 69 2883 PREVIOUS EDITIONS ARE OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
STABILITY ANALYSIS CONSIDERING UPLIFT BY THE WEDGE METHOD (CORPS VERSION)	741-F3-A2-530

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
L. H. Manson, Jr. Modified for CORPS by D. J. Beer	Jan 72	Mod 2	Dec 75

A. PURPOSE OF PROGRAM The program is intended to have general application in providing the safety analysis of any natural or man-made earth slope embankment for which shear failure may occur along a surface approximated by a series of planes. The program is directly applicable to all cases for which the wedge method of stability analysis is valid.

B. PROGRAM SPECIFICATIONS The program is written in Series 600 Timesharing Fortran for an HIS G-635 T/S System. It follows the format required by the Conversationally Oriented Real-Time Program-Generating System on the WES G-635. The program is limited to a maximum of 25 profiles with 41 coordinates each. Uplift for any strata may be calculated from one of five piezometric head profiles. Cohesion and unit weights can vary horizontally in each stratum from a maximum of 5 vertical locations. The assumed failure surface is a combination of active and passive wedges with central sliding block chosen to conform to (Over)

C. METHODS Program used the Method of Wedges in which soil mass is divided into three segments: an active wedge, a central block, and a passive wedge. The assumed failure plane for the active and passive wedges are inclined 45°-Ø/2 and 45°+Ø/2, respectively, with the vertical. Vertical boundaries are assumed between the central block and the active and passive wedges, and the forces on each segment are considered separately. The factor of safety is computed with respect to the shear strength of the soils. In general form, FS=summation of horizontal resisting forces divided by the summation of the horizontal driving forces. FS=(RA+RB+RP)/(DA+DB-DP)

D. EQUIPMENT DETAILS

The program is written for the WES HIS G-635 timesharing system and is executed from a remote teletype terminal.

E. INPUT-OUTPUT The input data requirements were established with the convenience of the user as a primary consideration; consequently, making the program easy to use, and requiring a minimum of data-preparation effort. Input data are as follows: Two title lines, locations where unit weights and cohesion may vary horizontally, coordinates which define the profile for each soil stratum, the friction angle, unit weight and cohesion values for each soil stratum. Coordinates which define phreatic surface and piezometric head profiles if (Over)

F. ADDITIONAL REMARKS Program is not documented, but interim input write-up information, and program listings are available.

Ref: 1. Department of the Army EM 1110-2-1902 Stability of Earth and Rock Fill Dams. 1 April 1970.
2. Department of the Navy NAVFAC DM-7 Soil Mechanics, Foundations, and Earth Structures. March 1971

NOD Eng Div ID # 5K71019; WES "CORPS" System Call Name: I0005

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2083 WHICH IS OBSOLETE.

B. PROGRAM SPECIFICATIONS (Cont)

stratification which does not have to be horizontal. The program is designed so the user may check any stratum or any elevation within that stratum.

E. INPUT-OUTPUT (Cont)

uplift is required. Output contains the coordinates for the three segments, and the complete driving, resistance and uplift data for each.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Slope Stability Analysis, Modified Swedish Method - I0009	741-F3-R0104

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Y. S. Jeng	1975	Complete	

A. PURPOSE OF PROGRAM

This program performs embankment slope stability analysis in accordance with Corps' Manual, EM 1110-2-1902, Stability of Earth and Rock-fill Dams, 1 April 1970.

B. PROGRAM SPECIFICATIONS

Program is written in FORTRAN.

C. METHODS

The modified Swedish Method considering the direction of interslice forces is used. Bilinear shear strength envelopes are constructed from the inputs of Q, R, and S strength.

D. EQUIPMENT DETAILS

Standard equipment for the GE-600 time-sharing system is used.

E. INPUT-OUTPUT

Input is given in free field from a pre-generated data file with line numbers between 10 and 999 inclusive. The dimensional units must be in feet-kip unit. Subroutine SREAD, a special system routine developed by WES, is used to read the continued input lines.
Output may be either printed during execution or stored on a disk file which is either pre-saved or created during execution.

F. ADDITIONAL REMARKS

1. This program is included in CORPS system.

2. This program is the same as the SAVA104 stored in USERID K6APD. A similar program is available for batch (Program No. 741-G9-R0104).

DD FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

3. Piles, Sheet Piles & Cells

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Three-Dimensional Pile Foundation Analysis	713-F3-A2-210

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
	(Operational)	PHASE	STAGE
H.C. Edgecombe, Jr.	March 75	Mod 7	Jan 70

A. PURPOSE OF PROGRAM

The purpose of the program is to provide a three-dimensional analysis of a pile foundation with battered piles.

B. PROGRAM SPECIFICATIONS

The program is written in FORTRAN IV time-sharing language for processing on the WES G-635 time-sharing system. Source file name is A2B00/K293D2, object file is executed in batch mode from a file in the CARDIN time-sharing sub-system and from the use of the appropriate control cards in remote batch.

C. METHODS

The general method of analysis is an expansion to three dimensions (by SAUL) of the Hrennikoff direct stiffness methods for a two-dimensional analysis.

D. EQUIPMENT DETAILS

WES G-635 Computer System with disc files and time-sharing terminal and/or remote job entry terminal.

E. INPUT-OUTPUT

Technical engineering data is entered in data file "D29010". Output consists of the forces and moments (3 dimensions) on each pile row in the foundation. Summary output is at the terminal, detailed output is on output file "P29010", and may be continued on file "Q29010" for large foundations.

F. ADDITIONAL REMARKS

Original program logic was adapted from the basic program authored by Mr. Mudd in the St. Louis District Office.

Engineering ID Number 5K29009

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2863 WHICH IS OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Anchored Bulkhead Design by Numerical Method - ANCWAL (X0027)	713-F3-F3010

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Author: Mark Grazioli Adapted for "CORPS" - WES ADPC	Written: 1965 Adapted: 1978	Complete	

A. PURPOSE OF PROGRAM

Design of Anchored Bulkhead Walls by soil analysis methods.

B. PROGRAM SPECIFICATIONS

Timesharing FORTRAN ›gram.

C. METHODS

The design of the walls is done by four soil analysis methods: equivalent beam; free earth support, elastic line (a fixed earth method); and equal moment. Calculates lateral loads resulting from active and passive earth pressures (including wall friction) by Coulomb theory.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT - OUTPUT

Input may be entered interactively from terminal or read from a previously prepared data file.

Output may come directly back to terminal or be stored in a file to be listed later.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 60 2883

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
BENT1 - Group Pile Analysis (I0002)	713-F3-R0014

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Dr. L. C. Reese and Dr. Frazier Parker Adapted for CORPS - WES ADPC	Adapted 1975	COMPLETE	

A. PURPOSE OF PROGRAM

Solves two-dimensional problems involving pile-supported foundations subjected to inclined and eccentric loadings.

B. PROGRAM SPECIFICATIONS

FORTRAN, Time-sharing program.

C. METHODS

Consists of an iterative solution for the three equilibrium equations developed using methods to handle the nonlinear behavior of individual piles. The purpose of the iterative procedure is to find the deflected position of the structure so that equilibrium and compatability are satisfied.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT-OUTPUT

Input may be entered from a prepared line-numbered data file or interactively at execute time. Output will be directed to an output file.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC 116000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
CANPLOT-CANTILEVER RETAINING WALL PILE ANALYSIS (Q&S CASES) Considering Uplift (Inter. Graphics Version)	741-F3-A2-020

PREPARING AGENCY

USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Mod. for graphics by B. Matherne, CANWALL ver. L. Manson Orig., M. Lamarca & Dennis Beer	June 1978	ORIGIN	April 78

A. PURPOSE OF PROGRAM The program computes lateral earth forces and overturning moments for each foot of depth along a cantilever retaining wall and balances each to satisfy stability requirements of the method of planes thereby determining the depth of penetration. It then uses the applied lateral earth forces, wave force, etc., on the pile to calculate the transverse shear force, bending moment, and deflection (from the undeformed position) at pertinent pile positions. The program can also plot the net pressure, deflection, or bending moment diagrams superimposed on the strata lines by means of either an interactive graphics terminal or a Calcomp drum plotter.

B. PROGRAM SPECIFICATIONS

The program is written in Series HIS G-600 FORTRAN IV and uses the Graphics Compatibility System (GCS). The program will analyze either the (S) Case or the (Q) Case and is limited to a static water condition, impervious sheet pile, and no water seepage pattern but can consider uplift. It can analyze a maximum of 12 strata with 24 points on each stratum profile and a pile that is no longer than 150 feet.

C. METHODS

Conventional method of planes with some minor modifications is used to evaluate the pile's stability. The shear force and bending moment at selected cross sections is determined by strength of material principals and statics. Deflections along perpendiculars from the unloaded configuration are determined by the Moment-Area Method. Net pressure, shear force, and bending moment diagram are plotted during the design phase.

D. EQUIPMENT DETAILS

The program requires an interactive graphics terminal similar to a Tektronix 4014-1; a Honeywell Information System G-635 computer with disc capability, timesharing, and GCS; and a Calcomp 925/1036 Drum Plotter.

E. INPUT-OUTPUT Input consists of names for requested files and other teletype prompts; job identification; head and tailwater and upper and lower tip range elevations; safety factor; number of strata; dynamic wave force and elevation; soil properties which includes friction angle, cohesions, and effective unit weight; coordinates to define each stratum profile; indicator to denote existence of tension crack; and pile properties which consists of Young's modulus, deflection reference, moment of inertia, section modulus and pile name.

(OVER)

F. ADDITIONAL REMARKS

Engineering Division ID No. - 5K71053

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

E. INPUT - OUTPUT (Cont)

Output consists of the active and passive pressures and cohesions, net pressure, water pressure, the depth of penetration and a printout and/or plot of the net pressures, transverse shear force, and bending moment at every foot along the pile and a printout of the deflections.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO
CANPLOT-CANTILEVER RETAINING WALL PILE ANALYSIS (Q&S Cases) Considering Uplift (Inter. Graphics Version)	741-X6-A2-020

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Converted to BCS and modified for graphics by B. Matherne, CANWALL ver. L. Manson, orig. by M. LaMarca & Dennis Beer	October 1978	Mod 1	Sep 1978

A. PURPOSE OF PROGRAM The program computes lateral earth forces and overturning moments for each foot of depth along a cantilever retaining wall and balances each to satisfy stability requirements of the method of planes thereby determining the depth of penetration. It then uses the applied lateral earth forces, wave force, etc., on the pile to calculate the transverse shear force, bending moment, and deflection (from the undeformed position) at pertinent pile positions. The program can also plot the net pressure, deflection, or bending moment diagrams superimposed on the strata lines by means of either an interactive graphics terminal or a Calcomp drum plotter.

B. PROGRAM SPECIFICATIONS
The program is written in the CYBER 175 FORTRAN Extended language and uses the Graphics Compatibility System (GCS developed at West Point). The program will analyze either the (S) Case or the (Q) Case and is limited to a static water condition, impervious sheet pile, and no water seepage pattern but can consider uplift. It can analyze a maximum of 12 strata with 24 points on each stratum profile and a pile that is no longer than 150 feet.

C. METHODS

Conventional method of planes with some minor modifications is used to evaluate the pile's stability. The shear force and bending moment at selected cross sections is determined by strength of material principals and statics. Deflections along perpendiculars from the unloaded configuration are determined by the Moment-Area Method. Net pressure, shear force, and bending moment diagram are plotted during the design phase.

D. EQUIPMENT DETAILS

The program requires an interactive graphics terminal similar to a Tektronix 4014-1; a CYBER 175 computer, similar to those operated by Boeing Computer Services, with disc capability, timesharing, and GCS; and a Calcomp 925/1036 Drum Plotter.

E. INPUT-OUTPUT
Input consists of names for requested files and other teletype prompts; job identification; head and tailwater and upper and lower tip range elevations; safety factor, number of strata; dynamic wave force and elevation, soil coordinates to define each stratum profile; indicator to denote existence of tension crack; and pile properties which consists of Young's modulus, deflection reference, moment of inertia, section modulus, and pile name.
(OVER)

F. ADDITIONAL REMARKS

Engineering Division ID No. - 7K70005

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE

E. INPUT - OUTPUT (Cont)

Output consists of the active and passive pressures and cohesion, net pressure, water pressure, the depth of penetration and a printout and/or plot of the net pressures, transverse shear force, and bending moment at every foot along the pile and a printout of the deflections.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
CANTILEVER RETAINING WALL STABILITY (Q&S Cases) "CORPS" VER.	741-F3-A2-370

PREPARING AGENCY
USAE, New Orleans District, P.O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Michael G. LaMarca	January 1976	Mod 3	

A. PURPOSE OF PROGRAM

The program determines the penetration of a cantilever retaining wall subjected to lateral forces that impart overturning moments. It also computes lateral earth forces and overturning moments for each foot of depth and balances each to satisfy stability requirements of the method of planes. The program also includes the anchored bulkhead or tieback analysis.

B. PROGRAM SPECIFICATIONS The program is written in Series 600 Timesharing FORTRAN for a HIS G-635. The program will analyze either the (S) Case, cohesion = 0, or (Q) Case, cohesion $\neq$ 0. It is limited to the following: static water condition, sheet pile impervious, no water seepage pattern developed. The program is designed to analyze a maximum of 12 strata with 24 points on each stratum profile. The program follows the format required by the Conversationally Oriented Real-Time Program-Generating System (CORPS) on the WES G-635.

C. METHODS

Conventional method of planes with some minor modifications is used to evaluate the stability of the cantilever retaining wall. Stability requires that for a given factor of safety the horizontal earth and water forces are in balance ($\Sigma F=0$) and the overturning moments of these forces about the bottom of the wall are in balance ($\Sigma M=0$).

D. EQUIPMENT DETAILS

The program is written for the WES G-635 HIS timesharing system and is executed from a low speed remote teletype terminal.

E. INPUT-OUTPUT

Input is punched on a paper tape and fed into a pre-assigned data file. Input consists of six basic types. Type 1 specifies whether or not tension cracks are to be computed. Type 2 consists of title and job identification. Type 3 contains head and tail water, upper and lower tip range, factor of safety, total number of strata, and elevation of bottom profile at the pile. Type 4 contains the dynamic wave force and elevation. Type 5 contains the soil properties for each stratum, one line of data for each stratum. (OVER)

F. ADDITIONAL REMARKS

Engineering Division ID No. - 5K71003; WES "CORPS" Library Name: I0007

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

E. INPUT - OUTPUT (Cont)

Type 6 contains the coordinates for each profile. Output is by means of the teletype paper carriage and consists of active and passive pressures and cohesions developed, net pressure, water pressure on the protected and flood-side of the pile, and the design elevation which satisfied stability of $\Sigma F=0$ and $\Sigma M=0$.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
CANTILEVER RETAINING WALL STABILIBY BY THE METHOD OF PLANES (S) CASE, C=ZERO	741-G1-A2120

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
L. H. Manson	December 1967		

A. PURPOSE OF PROGRAM
The program determines the penetration required to satisfy the stability requirements, the summation of unbalanced forces and moments at the required penetration and the lateral water and earth pressures acting on the sheet pile.

B. PROGRAM SPECIFICATIONS

C. METHODS
Conventional techniques, with some minor modifications, were used to evaluate the stability of the cantilever sheet pile retaining wall. The modifications were applied in the method of evaluating the effects of lateral earth pressures in which the ground configuration departed from the conventional horizontal condition.

D. EQUIPMENT DETAILS
The computer hardware necessary to implement the Cantilever Retaining Wall program is basically the General Electric Model 225 computer, AAU version, with 8K CPU, card reader, high speed printer, and console typewriter.

E. INPUT-OUTPUT
INPUT: a. elevations of headwater on floodside and tail-ater on protected side of the wall; b. range of sheet pile tip elevations to be investigated; c. ground elevation at the pile, & d. assigned factor of safety with respect to (S) shear strength of soil (C=0).
OUTPUT: project name, stability location, factor of safety used, and date of analysis.

F. ADDITIONAL REMARKS

WES FORM 1 JUL 60 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Cantilever Retaining Wall Design and Analysis - CANWAL (X0026)	741-F3-A2999

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Author: Leonard H. Manson Adapted for "CORPS" - WES ADPC	Written: 1977 Adapted: 1978	Complete	

A. PURPOSE OF PROGRAM

Determines the penetration of a Cantilever Retaining Wall subjected to lateral forces.

B. PROGRAM SPECIFICATIONS

Timesharing FORTRAN Program.

C. METHODS

Determines the penetration of the Cantilever Retaining Wall by method of planes. Analyzes the wall as a cantilever beam fixed at the theoretical depth of penetration, and determines shears, bending moments, and deflections per foot of wall.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT - OUTPUT

Input may be entered only from a predefined data file named D71004.

Output is stored in three predefined files to be listed later. The names of the files must be P71004, Q71004, R71004.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 60 2883

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Analysis of Circular Cofferdam or Mooring Cell Founded on Rock - CELLRK (X0028)	713-F3-H3190

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Author: Walter Green Randall Warren Adapted for "CORPS" - WES ADPC	Written: 1974 Adapted: 1978	Complete	

A. PURPOSE OF PROGRAM

Analysis of a circular cofferdam cell or circular mooring cell of a given equivalent width under specified loading conditions.

B. PROGRAM SPECIFICATIONS

Timesharing FORTRAN Program.

C. METHODS

Computes the following safety factors for circular sheet pile: Sliding; slipping between pile and cell fill; vertical and horizontal shears; and interlock tension. Follows method of analysis outlined in "USS Steel Piling Design Method."

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT - OUTPUT

Input may be entered interactively from terminal or read from a previously prepared data file.

Output may come directly back to terminal or be stored in a file to be listed later.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 60 2883

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Cellular Sheet Pile Structure - CELLSL (X0029)	713-F3-F1050

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Author: Elex Alter	Written - 1966	Complete	
Adapted for "CORPS" - WES ADPC	Adapted - 1978		

A. PURPOSE OF PROGRAM

Design of a sheet pile or a parallel wall by the Cumming's Method.

B. PROGRAM SPECIFICATIONS

Timesharing FORTRAN Program.

C. METHODS

The program uses an input equivalent width of cell or computes an initial equivalent width. All overturning moments computed are added accumulatively. The equivalent width of the cell with a tilting factor of safety greater than 1.5 is determined, or it determines a factor with a given equivalent width.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT - OUTPUT

Input may be entered interactively from terminal or read from a previously prepared data file.

Output may come directly back to terminal or be stored in a file to be listed later.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 60 2883

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
COM62 - Laterally Loaded Pile Analysis (I0001)	713-F3-R0018

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Dr. L. C. Reese Dr. N. Radhakrishnan Adapted for CORPS - WES ADPC	Adapted 1975	COMPLETE	

A. PURPOSE OF PROGRAM

Analyzes laterally loaded piles in nonlinear soil media. Solves for deflection, shear, moment, and reactions in a single pile under a variety of boundary conditions specified at the top of the pile.

B. PROGRAM SPECIFICATIONS

FORTRAN, Time-sharing program.

C. METHODS

In the analysis used in COM62, compatibility is achieved between the inelastic soil and the elastic pile (which is elastically restrained by the super structure) by repeated application of the elastic theory. The iterative analysis consists of a conventional beam on elastic foundation analysis coupled with the proper prediction of force-deformation characteristics of the soil.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT-OUTPUT

Input may be entered from a prepared line-numbered data file or interactively at execute time. Output will be directed to an output file.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Analyses of Pile-Soil Interaction (DUKFOR)	741-F3-R0008

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
D. M. Holloway	Sept 1976	Init	Op

A. PURPOSE OF PROGRAM

Analyzes pile-soil interaction behavior of single vertical axially loaded piles.

B. PROGRAM SPECIFICATIONS

Written in standard FORTRAN.

C. METHODS

One-dimensional finite difference analysis. Incorporates compatible dynamic equilibrium and static incremental equilibrium solutions to simulate impact pile driving and/or pile load test behavior.

D. EQUIPMENT DETAILS

G-635 computer.

E. INPUT-OUTPUT

See program documentation described below.

F. ADDITIONAL REMARKS

Documentation contained in WES Contract Report S-75-5, "The Mechanics of Pile-Soil Interaction in Cohesionless Soils," by D. M. Holloway, Dec 1975, and WES Contract Report S-76-14, "User's Manual for DUKFOR, A Computer Program for Analyses of Pile-Soil Interaction," by D. M. Holloway, Sept 1976.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
HRENNIKOFF PILE ANALYSIS WITH SUMMATION OF RESULTS	713-F3-A2-150

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
R. Villarubia, G. M. Finley, C. W. Ruckstuhl, Jr., and D. J. Elguezabal	May 74	Mod 8	1968

A. PURPOSE OF PROGRAM

Compute actual axial and transverse loads, and allowable transverse loads, on each pile row for each set of applied forces and moments on a given pile arrangement of a battered pile foundation by the Hrennikoff Method.

B. PROGRAM SPECIFICATIONS

Program is written in ASA FORTRAN with free-field input format.

C. METHODS The method used for computation of actual pile loads is explained in "Analysis of Pile Foundations with Batter Piles", by A. Hrennikoff, ASCE Transactions, Vol. 115, 1950, pp. 351-382. The basis for the computation of the allowable transverse loads is the theory that the sum of the ratios of actual axial stress to allowable axial stress and maximum actual flexural stress to allowable flexural stress must not exceed unity. For hinged end piles, the coefficient for maximum moment is assumed to be 0.50 which is slightly greater than the coefficient indicated in "Generalized Solution for Laterally Loaded Piles", by H. Matlock and L. C. Reese, ASCE Journal of Soil Mechanics (Over)

D. EQUIPMENT DETAILS

Program is written for use on a G-635 computer with GCOS operating system and FORTRAN time-sharing sub-system. Two disc files may be used for input and three scratch disc files are used. Program is accessed on the WES time-sharing system via remote terminal.

E. INPUT-OUTPUT Input consists of control variables, soil and pile properties, pile arrangement information and applied forces and moments for each load condition. Input can be via terminal keyboard as the program requests input in conversational mode; from input data file D29004 saved prior to running this program; from a binary output data file created and saved by program number 713-F5-A2-110 plus terminal keyboard input or from a binary output from 713-F5-A2-110 plus input saved on data file D29004. User has the option (OVER)

F. ADDITIONAL REMARKS

Program is limited to two dimensional applied loading and assumes all piles in the same row carry equal loads. The computation of allowable transverse loads is limited to hinged end piles.

Program is operational and has been tested within above limitations. Program is not documented, but listing and input information are available.

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2863 WHICH IS OBSOLETE.

C. METHODS (Cont)

Vol. 86, No. SM5, Proc. Paper 2626, Oct. 1960, PP 63-91. Program has also been modified to accept values for a stratified soil. The program has not yet been expanded to compute allowable transverse loads for piles that are considered to have their heads fixed in the pile cap.

E. *INPUT-OUTPUT (Cont)*

of obtaining a printout of all computed pile loads for each load condition; a printout of only the results for each pile row for the respective critical load condition, or a printout of the maximum allowable pile spacing for each pile row based on the respective critical load conditions.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
LMVDPILE - Rigid Cap 2- and 3-D Pile Analysis	713-F3-R0026

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Deborah Kaufman	December 1976	INIT	OP

A. PURPOSE OF PROGRAM

This program is a general method of analysis by direct stiffness of two- and three-dimensional pile foundations. The pile foundation consists of a group of piling placed into the soil topped with a rigid cap. Loads to the cap are transmitted by the piling to the soil. Determinations of deflections and individual pile loads are computed as required by the designer. Adequate representation of the soil-pile interaction is necessary.

B. PROGRAM SPECIFICATIONS

G-635 FORTRAN

24K Core

C. METHODS

The base is assumed rigid. Piles in a three-dimensional analysis are represented by a 6x6 stiffness matrix as proposed by Hrennikoff. In a two-dimensional analysis the piles are represented by a 3x3 stiffness matrix. The subgrade modulus may be constant or linearly varying. The solution is by a direct stiffness method.

D. EQUIPMENT DETAILS

Interactive T/S Terminal

Honeywell G-635

E. INPUT - OUTPUT

Input generally consists of pile geometric, material and fixity properties and the applied loads. Data may be input interactively or saved in a file prior to the run. (Detailed guide available from WES ADP Center).

Outputs structure, and pile deflections, pile forces along pile axis and along structure axis. Output may be directed to the terminal or saved in a file. Pile forces along the structure axis may be saved in a file.

F. ADDITIONAL REMARKS

ENG FORM 1 AUG 60 2883

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
MAKE - Generate P-Y Curves (10004)	713-F3-R0016

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Dr. Frazier Parker Adapted for CORPS - WES ADPC	Adapted 1975	COMPLETE	

A. PURPOSE OF PROGRAM

Generates soil resistance (p) versus pile movement (y) curves for soils surrounding a laterally loaded pile based on certain laboratory soil test results.

B. PROGRAM SPECIFICATIONS

FORTRAN, Time-sharing program.

C. METHODS

Uses different criteria for clays and sands. MAKE can handle any number of stratums of clay or sand and can also account for various pile diameters.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT-OUTPUT

Input may be entered from a prepared line-numbered data file or interactively at execute time. Output may be directed to an output file or come directly back to the terminal.

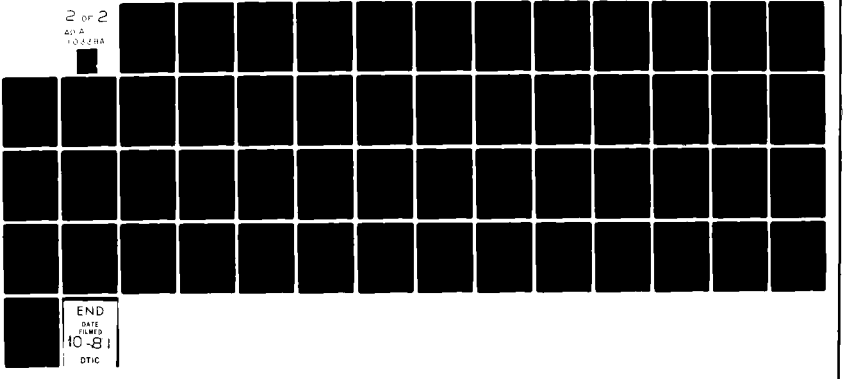
F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 70 2883 PREVIOUS EDITIONS ARE OBSOLETE.

AD-A103 384 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS F/G 13/13
LIST OF SOILS, SOIL-STRUCTURE INTERACTION AND OTHER RELATED COM--ETC(U)
MAY 81 N RADHAKRISHNAN, P K SENTER

UNCLASSIFIED WES-TR-K-81-1 NL



CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
3DPILE- Indeterminate Pile Analysis by Matrix Method (X0014)	713-F3-A3840

PREPARING AGENCY
U. S. Army Engineer District, St. Louis

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Thomas Mudd Joseph Hartman	August 1975		

A. PURPOSE OF PROGRAM

This program is a general method of analysis by direct stiffness of three-dimensional pile foundations. The pile foundation consists of a group of piling placed into the soil topped with a rigid cap. Loads to the cap are transmitted by the piling to the soil. Determinations of deflections and individual pile loads are computed as required by the designer. Adequate representation of the soil-pile interaction is necessary.

B. PROGRAM SPECIFICATIONS

Batch FORTRAN and Timesharing.

C. METHODS

The base is assumed rigid. Piles are represented by a 6X6 stiffness matrix as proposed by Hrennikoff. The solution is by a direct stiffness method.

D. EQUIPMENT DETAILS

Five temporary disk files, each 10L in size.
Low speed terminal, central processor.

E. INPUT-OUTPUT

Input can be on cards, in a timesharing file, or input interactively.

Output can be written to a timesharing file or printed on the terminal.

F. ADDITIONAL REMARKS

Hrennikoff, A., "Analysis of Pile Foundations with Batter Piles," Transactions, ASCE, Vol. 115, 1950, pp. 351-382.

Saul, William E., "Static and Dynamic Analysis of Pile Foundations," Journal of the Structural Division, ASCE, Vol. 94, No. ST5, Proceedings Paper 5936, May 1968, pp. 1077-1100.

Program is available through CORPS on WES G-635, CSC H6000 in Macon, GA, and Boeing Computer Service.

DD FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PILE CAPACITY COMPUTATIONS	741-F3-A2-110

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Dennis J. Beer	December 1974	ORIGIN	

A. PURPOSE OF PROGRAM

The program computes the pile bearing capacity which results from the pile end bearing, if applicable, and from the pile skin resistance from cohesion or adhesion and from friction. The pile capacity is computed for a pile in either compression or tension when the pile tip is either at the top, middle, or bottom of each stratum or at the top or bottom of each stratum and any other elevations selected by the user.

B. PROGRAM SPECIFICATIONS

The program is written in Series 600 Timesharing FORTRAN. The program is limited to fifteen strata and to either timber pile, square or octagonal concrete pile, or steel "H" pile. The bearing capacity is determined for up to thirty different locations of the pile tip.

C. METHODS

The program stores all input properties in arrays and using a bookkeeping process, it determines the output parameters as if the pile is being driven to pertinent elevations.

D. EQUIPMENT DETAILS

The program is written for the WES G-635 HIS Timesharing system and is executed from a low speed remote terminal.

E. INPUT-OUTPUT

Input data consists of the following for each soil stratum: the friction angle for soil to soil or soil to pile, the weight density, the coefficients of lateral earth pressure and Terzaghi's bearing capacity factors, the elevation of each stratum break at the pile and the cohesion at the top and bottom of each stratum. Also pile type and dimensions are given.

(OVER)

F. ADDITIONAL REMARKS

Engineering Division ID No. - 5K71039

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

E. INPUT - OUTPUT (Cont)

Output is a listing of the input data and of the skin cohesion or adhesion resistance and frictional resistance, the end bearing, if applicable, and the total pile capacity with end bearing and without end bearing for the pile whose tip is either at the top or bottom of each stratum, or either the middle of each stratum or other elevations selected by the user.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PILE CAPACITY COMPUTATIONS	741-X6-A2-110

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Dennis J. Beer; converted to Boeing Computer Services by K. Broussard	September 1978	Mod 1	Aug 78

A. PURPOSE OF PROGRAM

The program computes the pile bearing capacity which results from the pile end bearing, if applicable, and from the pile skin resistance from cohesion or adhesion and from friction. The pile capacity is computed for a pile in either compression or tension when the pile tip is either at the top, middle or bottom of each stratum or at the top or bottom of each stratum and any other elevations selected by the user.

B. PROGRAM SPECIFICATIONS

The program is written in the CYBER 175 FORTRAN Extended language. The program is limited to fifteen strata and to either timber pile, square or octagonal concrete pile, or steel "H" pile. The bearing capacity is determined for up to thirty different locations of the pile tip.

C. METHODS

The program stores all input properties in arrays and using a bookkeeping process, it determines the output parameters as if the pile is being driven to pertinent elevations.

D. EQUIPMENT DETAILS

The program requires a computer system similar to the Boeing Computer Services' CYBER 175 timesharing system and is executed from a low speed remote data terminal.

E. INPUT-OUTPUT Input data consists of the following for each soil stratum: the friction angle for soil to soil or soil to pile, the weight density, the coefficients of lateral earth pressure and Terzaghi's bearing capacity factors, the elevation of each stratum break at the pile and the cohesion at the top and bottom of each stratum. Also pile type and dimensions are given.
Output is a listing of the input data and of the skin cohesion or adhesion resistance and frictional resistance, the end bearing, if applicable, (OVER)

F. ADDITIONAL REMARKS

Engineering Division ID No. - 7K70007

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2863 WHICH IS OBSOLETE.

E. INPUT - OUTPUT (Cont)

and the total pile capacity with end bearing and without end bearing for the pile whose tip is either at the top or bottom of each stratum, or either the middle of each stratum or other elevations selected by the user.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PXAC3 - Axially Loaded Pile Analysis (I0003)	713-F3-R0015

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Dr. L. C. Reese, Dr. H. M. Coyle and Dr. N. Radhakrishnan Adapted for CORPS - WES ADPC	Adapted 1975	COMPLETE	

A. PURPOSE OF PROGRAM

Analyzes axially loaded piles in nonlinear soil media. Computes load-displacement relationships for axially loaded piles, where the pile has a constant outside diameter.

B. PROGRAM SPECIFICATIONS

FORTRAN, Time-sharing program.

C. METHODS

Uses finite difference equations to achieve compatibility between pile displacement and load transfer along the pile and between soil resistance and displacement at the tip of the pile.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT-OUTPUT

Input may come from a prepared line-numbered data file or interactively at execute time. Output may be directed to an output file or come directly back to the terminal.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

DD FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Design/Analysis of Sheet Pile Walls by Classical Method - SHTWAL (X0031)	713-F3-R0039

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Author: William P. Dawkins Adapted for CORPS - WES ADPC	Written - 1979 Adapted - 1979	COMPLETE	

A. PURPOSE OF PROGRAM

Performs either a design or analysis of an anchored or cantilever sheet pile retaining wall.

B. PROGRAM SPECIFICATIONS

FORTRAN, Time-sharing program.

C. METHODS

Uses classical soil mechanics procedures for determining the required depth of penetration of a new wall or assesses the factor of safety of an existing wall.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT-OUTPUT

Input may be entered from a predefined data file or interactively at execute time.

Output will be directed to an output file and/or directly back to the terminal.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
SSIWALL - Analysis of Sheet Pile Wall by Soil-Structure Interaction Method (X0033)	713-F3-R0051

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Dr. William P. Dawkins Adapted for "CORPS" - WES ADPC	Written - 1979	Complete	

A. PURPOSE OF PROGRAM

This is a special purpose program which performs soil-structure interaction (SSI) analysis of either anchored or cantilever retaining walls. Simplified procedures are incorporated in the program to automatically gererate the soil force-displacement characteristics from conventional soil properties.

B. PROGRAM SPECIFICATIONS

FORTRAN IV, Timesharing program.

C. METHODS

A one-dimensional finite element model of the sheet pile wall is established by defining nodes at three inch intervals starting at the top of the wall; at soil layer boundaries; at water surface elevations; at anchor attachment points; at points of application of horizontal live loads; at points describing an applied horizontal pressure distribution; and at the bottom of the wall.

D. EQUIPMENT DETAILS

Low speed terminal, central processor

E. INPUT-OUTPUT

Input may be entered from a predefined data file or interactively at execute time.

Output may be directed to an output file or come directly back to the terminal.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Wave Equation Analyses of Pile Driving (TAMFOR)	741-F3-R0007

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
D. Michael Holloway	June 1975	Init	Op

A. PURPOSE OF PROGRAM

One-dimensional wave equation analysis for analyzing impact pile-driving behavior.

B. PROGRAM SPECIFICATIONS

Written in standard time-sharing FORTRAN.

C. METHODS

Program adapted from Texas A&M University programs and converted to a time-sharing mode.

D. EQUIPMENT DETAILS

G-635 computer with time-sharing capability.

E. INPUT-OUTPUT

See documentation described below.

F. ADDITIONAL REMARKS

Documentation contained in WES TR S-75-5, "Wave Equation Analyses of Pile Driving," by D. M. Holloway, June 1975.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
WESTTI -- Wave Equation Analysis of Pile Foundations	741-F3-R0009

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
T. J. Hirsch; L. Carr; and L. L. Lowery WES Contact: Hugh M. Taylor, Jr.	April 1976	INIT	OP

A. PURPOSE OF PROGRAM

The program performs wave equation analysis of piles driven by a single blow of the hammer. Conventional pile and soil models were used. The program can be used to predict impact stresses in piles during driving and to estimate the static soil resistance on piles at the time of driving.

B. PROGRAM SPECIFICATIONS

C. METHODS

E. A. L. Smith's original numerical procedure was used in the wave equation computations.

D. EQUIPMENT DETAILS

E. INPUT-OUTPUT

Input forms and guidance are available in Volume II of manuals. Output is printed out in three basic sections. A summary of input data, time dependent solution for forces, and displacements of selected pile elements, and a summary of maximum compressive and tensile forces, maximum observed displacements and the permanent set per blow of the hammer and miscellaneous information are contained in the manuals.

F. ADDITIONAL REMARKS

Manuals by the Federal Highway Administration that describe the program and its use are: Vol. I, Background, Report No. FHWA-IP-76.13.1; Vol. II, Computer Program and Sample Problems, Report No. FHWA-IP-76-13.2; Vol. III, Program Documentation, Report No. FHWA-IP-76-13.3; and Vol. IV, Narrative Presentation, Report No. FHWA-IP-76-13.4.

ENG FORM 2883
1 AUG 68

PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
WESWEAP -- Wave Equation Analysis for Piles	741-F3-R0010

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
G. G. Goble and Frank Rausche WES Contact: Hugh M. Taylor, Jr.	July 1976	INIT	OP

A. PURPOSE OF PROGRAM

The program performs wave equation analysis of piles driven by a single blow of any type of impact hammer. Conventional pile and soil models were used in addition to both a thermodynamic model for diesels and refined mechanical hammer models. The program can be used to predict impact stresses in piles during driving and to estimate static soil resistance on piles at the time of driving.

B. PROGRAM SPECIFICATIONS

The program development was aimed at providing a simple input and both a flexible and extensive output that include automatic plotting capabilities. The computer language is FORTRAN IV.

C. METHODS

The pile and driving systems are represented by a series of discrete masses and springs. The soil is modeled by a spring and a dashpot attached to each mass. The soil resistance so represented are linear elastic plastic. The elastic resistances are linearly proportional to the element velocity for the velocity. By using Newton's Second Law, accelerations and displacements are calculated and the computation proceeds to the next time increment.

D. EQUIPMENT DETAILS

E. INPUT-OUTPUT

A short input and long or complete input forms are available. Common hammer property data are stored in a file. Input data is reprinted, options of printed and plotted parameters are available, and time plots are optional.

F. ADDITIONAL REMARKS

Manuals by the Federal Highway Administration that describe this program and its use are: Vol. I, Background, Report No. FHWA-IP-76-14.1; Vol. II, Users Manual, Report No. FHWA-IP-76-14.2, Vol. III, Program Documentation, Report No. FHWA-IP-76-14.3; and Vol. IV, Narrative Presentation, Report No. FHWA-IP-76-14.4.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

4. Seepage

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Two-dimensional finite element method seepage program.	704-F3-R0245

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, Vicksburg, Miss. 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Fred T. Tracy	May 1973	Exp	Op

A. PURPOSE OF PROGRAM

This program solves plane and axisymmetric steady-state and transient seepage problems by the finite element method (FEM).

B. PROGRAM SPECIFICATIONS

FORTRAN, single precision.

C. METHODS

Refer to Tracy, F. T., "A Plane and Axisymmetric Finite Element Program for Steady State and Transient Seepage Problems," Miscellaneous Paper K-73-4, May 1973, USAE Waterways Experiment Station, CE, Vicksburg, Miss.

D. EQUIPMENT DETAILS

G-635; memory requirements vary according to program size; file codes 1, 2, 3, 4, and 7 are used for temporary storage.

E. INPUT-OUTPUT

Input consists of the FEM grid information on cards. Output consists of the following printed information:

a. A printout of the input data.

b. Heads and flows at the nodes.

F. ADDITIONAL REMARKS

c. Discharge velocities at the centroids of the elements.

d. The position of the phreatic surface for unconfined flow problems.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Three-Dimensional Finite Element Program for Steady-State and Transient Seepage Problems.	704-F3-R0218

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, Mississippi 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Fred T. Tracy	May 1973	Exp	Op

A. PURPOSE OF PROGRAM

This program solves three-dimensional steady-state and transient seepage problems by the finite element method (FEM).

B. PROGRAM SPECIFICATIONS

FORTRAN, single precision.

C. METHODS

Refer to Tracy, F. T., "A Three-Dimensional Finite Element Program for Steady-State and Transient Seepage Problems", Miscellaneous Paper K-73-3, May 1973, USAE Waterways Experiment Station, CE, Vicksburg, Miss.

D. EQUIPMENT DETAILS

G-635; memory requirements vary according to problem size; file codes 1, 2, 3, 4, and 7 are used for temporary storage.

E. INPUT-OUTPUT

Input consists of the FEM grid information on cards. Output consists of the following printed information:

a. A printout of the input data.

b. Heads and flows at the nodes.

F. ADDITIONAL REMARKS

c. Discharge velocities at the centroids of the elements.

d. The position of the phreatic surface for unconfined flow problems.

DMS FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Design for Infinite System of Relief Wells (I0015)	741-F3-F5050

PREPARING AGENCY
U. S. Army Engineer District, St. Paul

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
G. L. Cohn and A. J. Ellingson Contact: R. Lundstrom	December 1971	COMP	

A. PURPOSE OF PROGRAM

To design relief well spacing for an infinite system of wells as suggested by WES Technical Memorandum No. 3-424, Vol. 1.

B. PROGRAM SPECIFICATIONS

Timesharing FORTRAN Program.

C. METHODS

The design procedure consists of making both the average pressure at the line of the wells and the unit flows as determined by external boundary conditions equations compatible with those same variables as determined by equations relating well configuration (trial and error solution).

D. EQUIPMENT DETAILS

Low speed terminal, Central processor.

E. INPUT-OUTPUT

Input may be entered interactively from terminal or read from a previously prepared data file.

Output may come directly back to terminal or be stored in a file to be listed later.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, Boeing CDC CYBER 175.

DD FORM 1 AUG 68 2883

5. *Stress Computation, Settlement, & Consolidation*

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Analysis of One Dimensional Consolidation - FD31 (I0011)	741-F3-R0106

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Dr. Roy Olson, Univ. of Texas Modified by: Reed Mosher, WES	1980		

A. PURPOSE OF PROGRAM

FD31 is a computer program which computes the settlements and rates of settlement in a multi-layered conesive soil profile.

B. PROGRAM SPECIFICATIONS

C. METHODS

The settlements and rates of settlement are computed by the use of finite difference methods applied by Terzaghi's one-dimensional consolidation theory.

D. EQUIPMENT DETAILS

Standard equipment: Honeywell 600, 6600-Series

E. INPUT-OUTPUT

Input is read into program in free field from a data file interactively from the terminal.

Output is printed to the terminal and/or the outfile.

F. ADDITIONAL REMARKS

This program is included in the CORPS system. Complete documentation is available from the Engineering Computer Programs Library (ECPL), WES.

ENG FORM 2883
1 AUG 69

PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Magnitude of Settlement of a Multi-Layered Soil System (MAGSET) (I0010)	741-F3-R0105

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
R. L. Schiffman, V. Partyha, and D. Jubenville, Univ. of Colo. Modified by: Reed Mosner, WES	1980		

A. PURPOSE OF PROGRAM

MAGSET is a computer program for calculating the magnitude of settlement of multi-layered soil profile containing granular and/or cohesive soil layers.

B. PROGRAM SPECIFICATIONS

C. METHODS

The settlement calculations and rates of consolidation in cohesive layers are based on Terzaghi's one-dimensional consolidation theory. The settlement calculations in granular soil layers are based on empirical correlations to static or dynamic penetration field tests. The methods of Meyerhof and D'Appolonia use data from the standard penetration test blowcount. Schmertmann's method uses data from the static cone penetrometer.

D. EQUIPMENT DETAILS

Standard equipments: Honeywell 600, 6600-Series

E. INPUT-OUTPUT

Input is read into program in free field from a data file interactively from the terminal.

Output is printed to the terminal and/or the outfile.

F. ADDITIONAL REMARKS

This program is included in the CORPS system. Complete documentation is available from the Engineering Computer Programs Library (ECPL), WES.

ENG FORM 2883
1 AUG 68

PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Vertical Stress Induction (I0008)	741-F3-A2540

PREPARING AGENCY
U. S. Army Engineer District, New Orleans

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Adapted for CORPS - WES ADPC	Adapted 1974	COMPLETE	

A. PURPOSE OF PROGRAM

Determines the influence coefficients for selected positions in a sub-grade medium.

B. PROGRAM SPECIFICATIONS

FORTRAN, Time-sharing program.

C. METHODS

This program employs the superposition of subsections using the principles of the BOUSSINESQ Point Load Formula for long strip loading (2-dimensional) to obtain its results.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT-OUTPUT

Input may be entered from a prepared data file or interactively at execute time.

Output may be directed to an output file or come directly back to the terminal.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 2883
1 AUG 68

PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Vertical Stresses Beneath Embankment and Footing Loadings (I0016)	741-F3-F5010

PREPARING AGENCY
U. S. Army Engineer District, St. Paul

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Douglas Spaulding	March 1968		OPER

A. PURPOSE OF PROGRAM

The program finds vertical stresses for applied structural loadings. Either the Boussinesq or Westergaard method of solution may be used. Either solution method assumes that the foundation material is homogeneous linearly elastic material and that superposition is valid.

B. PROGRAM SPECIFICATIONS

Timesharing Program.

C. METHODS

Westergaard or Boussinesq solution method of calculating stress under a rectangular loaded area. Embankments can be handled also.

D. EQUIPMENT DETAILS

Low speed terminal, Central processor.

E. INPUT-OUTPUT

Input may be entered interactively from terminal or read from a previously prepared data file.

Output may come directly back to terminal or be stored in a file to be listed later.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
VERTICAL STRESS INDUCTION AND SETTLEMENT ANALYSIS	741-X6-A2-400

PREPARING AGENCY

USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Jim Flock M. Pittman	March 1979	ORIGIN	

A. PURPOSE OF PROGRAM

To compute induced vertical stresses within a soil continuum due to a general-shaped imposed surface load, using either Westergaard or Boussinesq theory for both two- and three-dimensional analysis. To use the results for the computation of ultimate and time rate of consolidation.

B. PROGRAM SPECIFICATIONS

The program is written in FORTRAN for the CYBER 175 computer and employs the CALCOMP software for plot output.

C. METHODS

By using superposition and the general equation of stress-induction (derived by authors) an array of coordinates within the soil continuum are assigned values of vertical stress, which together with soil properties of individual strata yield ultimate settlement at specified horizontal positions along the soil surface. The soil properties are also used to determine time rate of settlement. Both plots and listings are available for the resulting computations.

D. EQUIPMENT DETAILS

1 CYBER 175
1 timesharing terminal (CRT)
or
1 high-speed printer and off-line Calcomp plotter

E. INPUT-OUTPUT

Input consists of a single input file of loading conditions, options and soil properties.
Output consists of plots of stress-bulbs, consolidation, vertical stress graphs and a listing of consolidation vs time for specified positions.

F. ADDITIONAL REMARKS

Engineering Division ID No. - 8K71001

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

6. Piezometer Data

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PIEZOMETER DATA EDIT PROGRAM	732-F3-A2-20A

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 631, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Joe Soileau	Jan 1978	ORIGIN	

A. PURPOSE OF PROGRAM

This program is used to edit and sort input data cards prior to entry into the master file.

B. PROGRAM SPECIFICATIONS

Program is written in FORTRAN & requires 16K memories.

C. METHODS

The program reads a card and performs various editing functions based on established criteria. If no error is found on a card the card record is written on a file to be used by the UPDATE PROGRAM-which immediately follows this program in the job stack. If an error is detected, the record is printed with an appropriate error message.

D. EQUIPMENT DETAILS

1. G-635 computer
2. 2 Disc files (5 links each)
3. Cope 1200 remote terminal

E. INPUT-OUTPUT

Input: Piezometer readings card records

Output: 1. valid input transactions file
2. error file (prints)

F. ADDITIONAL REMARKS

Engineering ID No. - 6K23007A

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PIEZOMETER MASTER FILE UPDATE PROGRAM	732-F3-A2-20B

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Joe Soileau	Jan 1978	ORIGIN	

A. PURPOSE OF PROGRAM

This program updates the PIEZOMETER MASTER FILE, using valid transactions from the edit program as input to update an existing file.

B. PROGRAM SPECIFICATIONS

The program is written in Fortran and requires 16K memory.

C. METHODS

The program updates an existing master file with valid update transactions provided by the edit program. The files are processed in sequence by adding, changing and deleting records by individual record transaction codes. A transaction report is provided to give the user complete details of every transaction which transpired-including invalid transactions.

D. EQUIPMENT DETAILS

1. G-635 Computer
2. 2 7-track tapes (556 bpi)
3. 1 disc file (25 links)
4. Cope 1200 remote terminal

E. INPUT-OUTPUT

Input: 1. Old master file (7-track tape)
2. Update transactions (disc file-25 links)

Output: 1. New piezometer master file (7-track tape)
2. Transaction report

F. ADDITIONAL REMARKS

Engineering ID No. - 6K23007B

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM		PROGRAM NO.
PIEZOMETER DATA EXTRACT PROGRAM		732-F3-A2-20C
PREPARING AGENCY		
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160		
AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM
		PHASE / STAGE
Joe Soileau	Feb 1978	ORIGIN

A. PURPOSE OF PROGRAM

This program extracts specified data from the PIEZOMETER MASTER FILE to be used as input to the PIEZOMETER PLOT PROGRAM.

B. PROGRAM SPECIFICATIONS

The program is written in Fortran and requires 16K memory.

C. METHODS

The program reads parameter card(s) which specifies a specific site and up to 10 specified piezometers at the site, along with a specified period of record. The selected installation records and piezometer reading records are written out to one file; the headwater and tailwater records are written out on a second file along scaling information for each frame. This second file is then sorted for appropriate data sequence.

D. EQUIPMENT DETAILS

1. G-635 computer
2. 1 7-track tape (556-bpi, piezometer master file)
3. 2 disc files
4. Cope 1200 remote terminal

E. INPUT-OUTPUT

Input: 1. Piezometer master file
2. Extract parameter file

Output: 1. Installation & piezometer readings file
2. Site headwater & tailwater file (with sealing info)

F. ADDITIONAL REMARKS

Engineering ID No. - 6K23007C

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PIEZOMETER PLOT PROGRAM	732-F3-A2-20D

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
J. A. Montegut III	Feb 1978	ORIGIN	

A. PURPOSE OF PROGRAM

This program plots the data outputed from the extract program (732-F3-A2-20C)

B. PROGRAM SPECIFICATIONS

The program is written in the Honeywell Series 600/6000 Fortran.

C. METHODS

The program reads the output from program 732-F3-A2-20C and plots the specified piezometer readings vs time. Scaling information is also read from the "Extract" program. The program uses conventional Calcomp plotting techniques.

D. EQUIPMENT DETAILS

A remote job entry terminal which can access a Honeywell Information System G-635 computer system with disc and tape capabilities and a Calcomp drum plotter, Model #925/1036.

E. INPUT-OUTPUT

Input: 1. Installation & piezometer readings file.
2. Site headwater & tailwater file (with scaling info)
Output: 1. A calcomp plot of piezometer readings vs time plotted to user specified scales and dimensions.

F. ADDITIONAL REMARKS

Engineering ID No. - 6K23007D

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PIEZOMETER AUDIT SUMMARY REPORT	732-F3-A2-20E

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Joe Soileau	Feb 1978	ORIGIN	

A. PURPOSE OF PROGRAM

This program prepares a report summarizing the contents of the PIEZOMETER MASTER FILE.

B. PROGRAM SPECIFICATIONS

The program is written in Fortran and requires 10K memory.

C. METHODS

The program scans the PIEZOMETER MASTER FILE and produces a report for each site, delineating the piezometers at each site along with the "mean-max-min" period-of-record, and number of recordings for each piezometer at a site. Similar statistics are provided for headwater & tailwater at each site.

D. EQUIPMENT DETAILS

1. G-635 computers
2. 1 7-track tape
3. COPE 1200 remote terminal

E. INPUT-OUTPUT

Input: Piezometer Master File
Output: Audit Summary Report

F. ADDITIONAL REMARKS

Engineering ID No. - 6K23007E

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

NAME OF PROGRAM	PROGRAM NO.
PIEZOMETER TABULAR LISTING	732-F3-A2-20F

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Joe Soileau	Nov 1978	ORIGIN	

A. PURPOSE OF PROGRAM

This program is used to prepare a tabular listing of piezometer readings, along with headwater and tailwater readings, for any number of prescribed installation sites and for a prescribed period-of-record. This program will replace a great deal of drafting work in preparation of the tabulation sheets in various reviews and publications.

B. PROGRAM SPECIFICATIONS

The program is written in 2 FORTRAN modules along with a GMAP SORT MACRO, requiring 32K memory.

C. METHODS

The first FORTRAN module extracts prescribed data from the piezometer master file, prepares the records in proper groups for sorting and writes the data on a temporary file. The GMAP SORT MACRO then sorts the records as required for the second FORTRAN module. Finally, the second FORTRAN module reads the sorted file and prepares the Tabulation Report.

D. EQUIPMENT DETAILS

1. G-635 computer
2. 1 7-track tape
3. 2 disk files (1 linked file, 1 random file, 50 links each)
4. COPE 1200 remote terminal
5. 1 timesharing terminal

E. INPUT-OUTPUT

Input: 1. Piezometer master file
2. Extract parameter file

Output: Piezometer tabulation report

F. ADDITIONAL REMARKS

Engineering Division ID No. - 6K23007F

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2863 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PIEZOMETER INFORMATION SYSTEM PLOT (CRT Version)	732-F3-A2-20G

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
J. A. Montegut III Revised for interactive graphics by Kinney Beniot	April 1978	ORIGIN	Apr 78

A. PURPOSE OF PROGRAM

The program generates a plot of piezometer, headwater, and tailwater elevations versus dates the data was recorded on an interactive graphics display terminal. The plot should be used as a visual edit of this data extracted by 732-F3-A2-20C before Calcomp drum plot is produced by 732-F3-A2-20D.

B. PROGRAM SPECIFICATIONS

The program is written in the Honeywell Series 600/6000 FORTRAN IV and requires the Graphics Compatibility System interactive graphics routines for execution. The program is part of the "Piezometer Information System".

C. METHODS

The program reads the output from program number 732-F3-A2-20C and plots specified piezometer, headwater, and tailwater readings for a specific installation versus time. Scaling information is also read from the 732-F3-A2-20C extracted data which resides on the "Piezometer Information System" data base.

D. EQUIPMENT DETAILS

The program needs an interactive graphics display terminal similar to Tektronix 4014-1 data terminal and a timesharing system similar to the WES HIS G-635 computer system with disc capabilities.

E. INPUT-OUTPUT

Input: 1. Installation and Piezometer Reading File extracted by 732-F3-A2-20C.
2. Site Headwater and TailwaterFile with scaling information extracted by 732-F3-A2-20C.

Output: An interactive graphics display terminal plot of piezometer, headwater, and tailwater readings versus time.

F. ADDITIONAL REMARKS

Program request implied in Paragraph 1.C, of the DF, LMNED-DD, dated 28 September, subject: ADP Applications, written by Mr. Bob Grubb for Mr. Ted Mehrtens.

Engineering ID No. - 5K23005

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2863 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PIEZOMETER PROFILE PLOT EXTRACT	732-F3-A2-20H

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Phil Winterfield	May 1979	ORIGIN	

A. PURPOSE OF PROGRAM

This program will extract data from the "Piezometer Information System" master data tape and write the extracted data onto disc in the format suitable for use with the "Piezometer Profile Plot".

B. PROGRAM SPECIFICATIONS

A maximum of 20 piezometer readings for 10 days of record may be extracted. This program is written in FORTRAN IV and is part of the "Piezometer Information System".

C. METHODS

The program reads from a sorted master tape and writes these records to a quick access disc file.

D. EQUIPMENT DETAILS

1 G-635 computer
1 Remote Job Entry Terminal
1 7-track Tape Drive

E. INPUT-OUTPUT

Input: 1 7-track tape from "Piezometer Information System" master tape.

Output: 1 Disc File

F. ADDITIONAL REMARKS

Reference is made to DF dated 16 January 1979 from C/F&M Branch to C/Survey Branch concerning subject: Item E-4, Sand Drain Evaluation Section.

Engineering Division ID No. - 6K23007H

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PIEZOMETER PROFILE PLOT	732-F3-A2-20I

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Phil Winterfield	May 1979	ORIGIN	

A. PURPOSE OF PROGRAM

This program is used to graphically display piezometer water surface profiles (elevation versus distance) for up to 10 individual dates of record.

B. PROGRAM SPECIFICATIONS

Up to 20 piezometer readings for 10 days of record may be shown in one graphic display. All of the data from the extracted data file will be plotted on each plot run. This program is written in FORTRAN IV and is part of the "Piezometer Information System".

C. METHODS

The program uses the output generated by the "Piezometer Profile Extract" program to provide a CRT or Calcomp plot of the extracted data. The data is plotted onto a Cartesian coordinate system.

D. EQUIPMENT DETAILS

1 G-635 Computer
1 Tektronix 4014 CRT
1 Harris COPE (Remote Job Entry Terminal)
1 Calcomp 925/1036 Drum Plotter

E. INPUT-OUTPUT

Input: 1 quick access disc file

Output: 1 CRT plot or Calcomp plot

F. ADDITIONAL REMARKS

Reference is made to DF dated 16 January 1979 from C/F&M Branch to C/Survey Branch concerning subject: Item E-84, Sand Drain Evaluation Section.

Engineering Division ID No. - 6K23007I

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
PIEZ CHANGE FOR T.O.R., WS, HW & TW	732-F3-A2-20J

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Joseph V. Soileau	Nov 1979	ORIGIN	

A. PURPOSE OF PROGRAM

The purpose of program is to search the piezometer master tape to find a specific piezometer and between specific dates have the ability to change (by adding numerically) either, or all, of the elevation records representing top of riser, water surface elevation in the riser, headwater and tailwater elevations.

B. PROGRAM SPECIFICATIONS

The program is written in FORTRAN and requires 26K memory.

C. METHODS

The user completes input data containing the following:

a. Station code
b. Piez code
c. B record
d. Date (initial)
e. Date (final)
f. Top of riser elevation adjustment
g. Riser surface elevation adjustment
h. Headwater elevation adjustment
i. Tailwater elevation adjustment

D. EQUIPMENT DETAILS

Timesharing Terminal and COPE Terminal
G-635 Computer

E. INPUT-OUTPUT

Input: Timesharing (CARD) or Cards

Output: 1. Printer
2. 7-track tape

F. ADDITIONAL REMARKS

Engineering Division ID No. - 6K23007J (Source) - 8 Nov 79
6K23008J (BCD,NOGO)
K23007J (JCL)

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

7. Instrumentation & Laboratory Data

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Digit 8	741-G1-A4040

PREPARING AGENCY
Analytical Section, F&M Branch, U. S. Army Engineers, Vicksburg District

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
G. Wardlaw			

A. PURPOSE OF PROGRAM

This program is an interactive data reduction program used to reduce data from the Slope Indicator Mag Tape Reader, Vertical Slope Pipes.

B. PROGRAM SPECIFICATIONS

C. METHODS

D. EQUIPMENT DETAILS

Tektronix 4081

E. INPUT-OUTPUT

Input data transferred directly from Slope Indicator Mag Tape Reader.
Output data presented as table of movement and plot of movement.

F. ADDITIONAL REMARKS

WES FORM 1 JUL 80 2205

REPLACES ENG FORM 2693 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
SLOPE INCLINOMETER DATA SYSTEM-EXTRACT	741-F3-A2-570

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Philip Winterfield	December 1979	ORIG	

A. PURPOSE OF PROGRAM

This program will perform extract requests from the systems master data tape, convert the data to depths in feet and deflections in inches and write this information to a quick-access disc file in a format suitable for use with the slope inclinometer plot program.

B. PROGRAM SPECIFICATIONS

The program will extract information for up to 10 days for 6 well sites. The languages used is FORTRAN IV. The program is part of the "Slope Inclinometer Data System".

C. METHODS

An initial data reading for each well is used as a reference to all subsequent readings. Computations are based on the difference between the initial and subsequent deflection readings and on changes in elevation.

D. EQUIPMENT DETAILS

1 - G-635 Computer
1 - 7-Track Tape Drive
1 - Disc Drive

E. INPUT-OUTPUT

Input: 1 7-Track Tape Drive
Output: 1 Disc file

F. ADDITIONAL REMARKS

Engr. Div. ID # 6K74003C

Request for the "Slope Inclinometer Data System" is implied in the DF, LMNED-FD, dated 16 January 1979, subject: Item E-84, Sand Drain Evaluation Section.

WES FORM 1 JUL 80 2205

REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

8. Plotting Programs

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
GENERAL TYPE BORING LOG PLOT, MOD. 7	741-F3-A2-230

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
L. H. Manson, Jr. converted to HIS G-635 by M. G. LaMarca	March 1976	Mod 7	Feb 1976

A. PURPOSE OF PROGRAM

To plot a graphic representation of General Type soil and rock symbol and either the water content, stratum change, D_{10} grain size, consistency, color, modification symbols, and penetration, or a variable input description of the physical properties of the soil or rock may be plotted.

B. PROGRAM SPECIFICATIONS

The program is written in the Honeywell Series 600/6000 FORTRAN and requires the Calcomp plot software for execution. The program was written to conform to all standards used in the Lower Mississippi Valley Division for plotting General Type soil and rock borings. There is no limit to the depth or number of borings per plate.

C. METHODS

A rock symbol can be plotted over a soil or another rock symbol to produce any combination of symbols. Additional soil or rock symbols can be added to the program with slight modification.

D. EQUIPMENT DETAILS

One remote job entry terminal which can access a Honeywell Information System G-635 computer system with disc capabilities. The system must also be capable of transmitting card image plot records to a remote job entry terminal. A Calcomp Drum Plotter, Model 925/1036 is also required.

E. INPUT-OUTPUT

Input is by cards which are punched directly from a Soil Laboratory Boring Log Form. This form is prepared when the log samples are analyzed and is retained as a permanent record of the log. Additional input from six plate title cards and from a general card defining the horizontal and vertical scale and the number of logs per plate is required if a final plate is desired. Output is by means of a printer which lists the data and by means of a magnetic tape which contains the log plot.

F. ADDITIONAL REMARKS

Laboratory Boring Log Form, data write-up, output description, and operating instruction are available.

Engineering Division ID #6K71001

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
UNDISTURBED BORING LOG PLOT WITH GRID	741-F3-A2-240

PREPARING AGENCY
USAE, New Orleans District, P. O. Box 60267, New Orleans, LA 70160

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
L. H. Manson Jr. converted to HIS G-635 by M. LaMarca	March 1976	Mod 3	Feb 76

A. PURPOSE OF PROGRAM

To plot a graphic representation of undisturbed type soil boring logs, and to plot the data grid, plasticity chart, shear strength data charts, and consolidation data grid which may consist of two, three or four cycle log grids. The soil symbols, stratum changes, penetration resistances, D_{10} sizes, consistences, and modification symbols can be plotted on the log.

B. PROGRAM SPECIFICATIONS

The program is written in the Honeywell Series 600/6000 FORTRAN and requires the Calcomp plot software for execution. The program has been written to conform to all standards used in the Lower Mississippi Valley Division for plotting Undisturbed Boring Logs. The program generates either a 32 or 40 inch plate with either a 2, 3, or 4 cycle consolidation grid or no consolidation grid at all. Shear strength may be plotted on variable scale.

C. METHODS

Subroutines were written for each soil symbol (unified Soil Classification) shown on Soil Boring Legend (File No. H-2-21800) used in LMVD. Additional soil symbols can be added to the program with slight modification.

D. EQUIPMENT DETAILS

One remote job entry terminal which can access a Honeywell Information System G-635 computer system with disc capabilities. The system must also be capable of transmitting card image plot records to a remote job entry terminal. A Calcomp Drum Plotter, Model 925/1036 is also required.

E. INPUT-OUTPUT Input is by cards which are punched directly from Soil's Laboratory Boring Log Form (LMN Form 721). The form is prepared when the log samples are analyzed and is retained as a permanent record of the log. Output is by printer and contains a listing of the data and by magnetic tape which contains the plate plot. The plotted plate consists of the boring log, the test data values plotted on the appropriate grid, the border, title block, vertical staff, and the grids for plotting the water contents, shear strengths, wet densities, normal stresses, plasticities, and consolidations.

F. ADDITIONAL REMARKS

Laboratory Boring Log Form (LMN 721), data write-up, and operating instructions are available.

Engineering Division ID No. - 6K71003

WES FORM 1 JUL 80 2205 REPLACES ENG FORM 2883 WHICH IS OBSOLETE.

9. Finite Element Method/Finite Difference

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
A Three-Dimensional Finite Element Data Edit Program	704-F3-R0219

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Fred T. Tracy Alberta M. Wade	August 1979	INIT	

A. PURPOSE OF PROGRAM

This program plots a three-dimensional (3-D) finite element (FE) grid using as input the data cards for either the SAP5 or 3-D Seepage FE analysis programs. The FE grid can be plotted with either hidden lines deleted or all lines. The picture can also be rotated for obtaining different views.

B. PROGRAM SPECIFICATIONS

The program runs on the Honeywell G-635 computer and takes 79K memory with the maximum number of nodes and elements both set at 1000. The graphics software used is the Graphics Compatibility System (GCS) and thus the program runs in the ASCII (as compared to BCD) mode. The dimensions can therefore be reduced and the program will run with slight modification on the Tektronix 4012, 4014, or 4016 terminal.

C. METHODS

Hidden lines are determined using the Watkins hidden surface algorithm. These and other techniques (such as orthographic protection) are described in the Instruction Report K-80-3 which documents this program.

D. EQUIPMENT DETAILS

In the batch mode the program produces a magnetic tape to be used off-line to produce a Calcomp drum plot. In the time sharing mode the program plots the FE grid on a Tektronix 4012, 4014, or 4016 interactive graphics terminal.

E. INPUT-OUTPUT

The grid is read from file code 02, and commands which describe how to plot the grid are given in file code 01. The output file code for the drum plotter is 37. The printout is assigned to file code 07. File code 04 is used for temporary storage.

F. ADDITIONAL REMARKS

All or part of the elements can be plotted. Window or close-up plots of particular regions can also be obtained. Node and element numbers can be plotted upon request.

DD FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
A Finite Element Program for Axisymmetric or Plane Strain Simulation of Soil-Structure Interaction (AXISYM)	713-F3-R0030

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
D. M. Holloway	Sep 1976	Init	Op

A. PURPOSE OF PROGRAM

Calculates stresses and displacements for static soil-structure interaction problems using an incremental/iterative displacement formulation.

B. PROGRAM SPECIFICATIONS

Written in standard G-6000 FORTRAN.

C. METHODS

Provides solutions to either plane strain or axisymmetric problems involving concentrated force, nodal displacement, and boundary pressure loading conditions only.

D. EQUIPMENT DETAILS

G-635 Computer.

E. INPUT-OUTPUT

See documentation described below.

F. ADDITIONAL REMARKS

Documentation contained in WES Contract S-76-13, "User's Manual for AXISYM: A Finite Element Program for Axisymmetric or Plane Strain Simulation of Soil-Structure Interaction," by D. M. Holloway, Duke University, Sep 1976.

ENG FORM 2883
1 AUG 68

PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
BISAR	713-F3-R0053

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Shell Oil Company	August 1974		

A. PURPOSE OF PROGRAM

This is a general-purpose program for computing stresses, strains and displacements in elastic multilayered systems subjected to one or more uniform loads, acting uniformly over circular surface area. These surface loads can be combinations of a vertical normal stress and a unidirectional tangential stress.

B. PROGRAM SPECIFICATIONS

FORTRAN IV

C. METHODS

Conventional engineering techniques are utilized. Standard programming methods in FORTRAN IV are used.

D. EQUIPMENT DETAILS

Program is for Honeywell 6000 series computer but can operate on any compatible system. No special computer equipment is required.

E. INPUT-OUTPUT

Input consists of the data required to compute the stresses, strains, and displacements.

Output data is listed with identifying headings. Normal output shows all stresses, strains and displacements.

F. ADDITIONAL REMARKS

Complete documentation of this program is available from the Engineering Computer Programs Library (ECPL), WES.

Distribution outside the Corps of Engineers must be approved by the Shell Oil Company.

ENG FORM 2883
1 AUG 68

PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
BMCOL - Numerical Analysis of Beams and Beam-Columns (X0032)	713-F3-R0050

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
T. Allen Haliburton Oklahoma State University Adapted for "CORPS" - WES ADPC	Written - 1971 Adapted - 1979	Complete	

A. PURPOSE OF PROGRAM

This program solves a linearly elastic beam-column loaded and restrained in various manners or solves a beam-column in nonlinear soil and/or other type of nonlinear load-deflection.

B. PROGRAM SPECIFICATIONS

FORTRAN IV, Timesharing program.

C. METHODS

Finite difference method is used to model the linearly elastic beam-column. Linear or nonlinear restraints may be placed along the beam column.

D. EQUIPMENT DETAILS

Low speed terminal, central processor.

E. INPUT-OUTPUT

Input may be entered from a predefined data file or interactively at execute time.

Output may be directed to an output file or come directly back to the terminal.

F. ADDITIONAL REMARKS

Program is available through the CORPS on WES G-635, CSC H6000 at Macon, GA, and Boeing Computer Services.

DD FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
An Iterative Layered Elastic Computer Program for Rational Pavement Design (CHEVIT)	713-F3-R0031

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Yu T. Chou	Feb 1976	Init	Op

A. PURPOSE OF PROGRAM

Rational design of pavements incorporating stress-dependent moduli of pavement materials.

B. PROGRAM SPECIFICATIONS

Written in standard G-6000 FORTRAN.

C. METHODS

Expanded and modified version of a Chevron Oil Company program which is based on Burmister's linear layered elastic solution. Incorporates stress-dependent moduli of pavement materials through iterative procedures and also accounts for linear problems.

D. EQUIPMENT DETAILS

G-635 Computer

E. INPUT-OUTPUT

See documentation described below.

F. ADDITIONAL REMARKS

Documentation contained in WES Technical Report S-76-3, "An Iterative Layered Elastic Computer Program for Rational Pavement Design," by Yu T. Chou, Feb 1976.

DNG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Wilson's Plane Stress Finite Element Code (FEMWIL)	713-F3-R0013

PREPARING AGENCY: U.S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, Miss. 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Prof. E. L. Wilson	1966	Mod	Op

A. PURPOSE OF PROGRAM

To compute stresses and deformations in a linear elastic or bilinear elastic medium. Can work plane stress or axisymmetric problems. Can be made to work plane strain problems by modifying the input of the modulus and Poisson's ratio.

B. PROGRAM SPECIFICATIONS

Coded in FORTRAN IV. Uses 2 scratch tapes during execution.

C. METHOD

Finite element method using constant strain triangles (CST). Quadrilateral element can be input (program decomposes each quadrilateral to 4 CST's).

D. EQUIPMENT DETAILS

GE 600 and GE 400 series computers (Batch and Time-sharing).
G-600 Time-sharing version also available on WESLIB.

E. INPUT-OUTPUT

Input by cards. Output on printer and/or in punched cards.

F. ADDITIONAL REMARKS

References:

Wilson, E. L., Short Course on Finite Elements - Class Notes
University of California 1965-1968.

DD FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Stress-Deformation Analyses of Soils - I FESS41	713-F3-R010A

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, Vicksburg, Miss. 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
N. Radhakrishnan (based on a 1966 program by Prof. E. L. Wilson)	1966-1969		

A. PURPOSE OF PROGRAM

Computation of stresses and deformations in soil masses in plane strain geometry. Program takes into account the nonlinear behavior of soil systems. Program can be used for any stress-analysis problem including footing analysis, gravity turn-on stresses and deformations in earth dams and slopes, etc.

B. PROGRAM SPECIFICATIONS

Program is coded in FORTRAN IV language. Uses 2 scratch tapes during execution.

C. METHODS

Finite element method using constant strain triangles (CST). Quadrilaterals can be input (program decomposes each quadrilateral to 4 CST's). Nonlinear analysis is done by an incremental-iterative procedure. Program takes in soil triaxial compression stress-strain curves in a tabular form for the nonlinear analysis.

D. EQUIPMENT DETAILS

Can run on GE 400, GE 600, and CDC 660 computers. Can be easily modified to run on other computers (with storage greater than 32K).

E. INPUT-OUTPUT

Input is in the form of cards and output is printed.

F. ADDITIONAL REMARKS

References:

1. Radhakrishnan, N., "Solution of Soil Plane Strain Problems in Soil Mechanics Using the Method of Finite Elements", Ph.D. Thesis, University of Texas at Austin, May 1965.

2. Radhakrishnan, N., "WES Short Course on Finite Element Method - Class Notes", 1970.

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM		PROGRAM NO.
Stress-Deformation Analyses of Soils - III	FESS412	713-F3-R010B

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, Vicksburg, Miss. 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
N. Radhakrishnan, (based on a 1966 program by Prof. E. L. Wilson)	1971		

A. PURPOSE OF PROGRAM

Computation of stresses and deformations in soil masses in axisymmetric or plane strain geometry. Program takes into account the nonlinear behavior of soil systems. Program can be used for any stress-analysis problem including footing analysis, gravity turn-on stresses and deformations in earth dams and slopes, etc.

B. PROGRAM SPECIFICATIONS

Program is coded in FORTRAN IV language. Uses 2 scratch tapes during execution.

C. METHODS

Finite element method using constant strain triangles (CST). Quadrilaterals can be input (program decomposes each quadrilateral to 4 CST's). Nonlinear analysis is done by an incremental-iterative procedure. Program takes in nonlinear stress-strain data fitted in a hyperbolic form for both the shear modulus and the Poisson's ratio.

D. EQUIPMENT DETAILS

Can run on GE 400, GE 600, and CDC 660 computers. Can be easily modified to run on other computers (with storage greater than 32K).

E. INPUT-OUTPUT

Input is in the form of cards and output is printed. Printer-plots of stress, strain, and deformation levels can also be obtained in the GE 600 version.

F. ADDITIONAL REMARKS

See FESS41 (713-F3-R010A)

DD FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Finite Element Method Post Processor (GPOSTFEM)	704-F3-R0005

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Fred Tracy	Oct 76	Init	Op

A. PURPOSE OF PROGRAM

Program is a post processor which takes a data file generated from a FEM analysis program and graphically displays results as 1) numbers, 2) contours, 3) vectors, 4) displaced grid, 5) orthographic view, or 6) perspective view. Provides rapid, easy determination of what a FEM analysis really means.

B. PROGRAM SPECIFICATIONS

Program is written in Honeywell 600/6000 time-sharing FORTRAN, and uses Graphics Compatibility System (GCS) for plotting.

C. METHODS

Interactive choice of display types for a given set of output data.

Hard copies of desired plots can be made on off-line drum plotter.

D. EQUIPMENT DETAILS

Honeywell G-635 computer with time-sharing capability

Tektronix 4012 or 4014 graphics terminal

CalComp 925/1036 drum plotter

E. INPUT-OUTPUT

Input:

FEM output data:
1) Grid size
2) Node data
3) Element data

Output: Graphical display of FEM output in one of six forms given in A above, along with grid outline for each plot.

F. ADDITIONAL REMARKS

Documentation contained in Miscellaneous Paper No.K-77-4, Aug 1977, available from Engineering Computer Programs Library, USAE Waterways Experiment Station, P. O. Box 631, Vicksburg, MS 39180.
FTS 542-2581

DD FORM 1 AUG 68 2083 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
An Interactive Graphics Finite Element Method Grid Generator for 2-D Problems (GPREFEM)	704-F3-R0006

PREPARING AGENCY: U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Fred Tracy	August 1977	Init	Op

A. PURPOSE OF PROGRAM

This program starts with an input data file that describes the geometry of the problem and the density of nodes and elements and generates a finite element method (FEM) grid. Boundary condition information, smoothing, bandwidth minimization, and triangle removal can be applied to the generated grid.

B. PROGRAM SPECIFICATIONS

Program written in Honeywell 600/6000 time-sharing FORTRAN.

C. METHODS

See Tracy, Fred T., "Graphical Pre- and Post-Processor for 2-Dimensional Finite Element Method Programs", SIGGRAPH-ACM, Volume II, Number 2, Summer 1977.

D. EQUIPMENT DETAILS

Honeywell G-635 computer with time-sharing capability.
Tektronix 4012 or 4014 graphics terminal
CalComp 925/1036 drum plotter

E. INPUT-OUTPUT

The input data file can be interactively edited, and the results then saved in a restart file.

The grid can also be interactively plotted and edited and then saved in an output file.

F. ADDITIONAL REMARKS

Documentation contained in Miscellaneous Paper No. K-77-5, Aug 1977, available from Engineering Computer Programs Library, USAE Waterways Experiment Station, P. O. Box 631, Vicksburg, MS 39180.
FTS 542-2581

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
H-51	713-F3-R0052

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
General Dynamics Company	19 December 1966	ORIGINAL	

A. PURPOSE OF PROGRAM

This program provides an analytical method for calculating the bending stress at a point in a given direction on a loaded concrete pavement. The load on the pavement is considered to be uniformly distributed over the entire contact area, such as the contact area of an aircarft's tires on a runway.

B. PROGRAM SPECIFICATIONS

FORTRAN IV

C. METHODS

Conventional engineering techniques are utilized. Standard programming methods in FORTRAN IV are used.

D. EQUIPMENT DETAILS

Program is for Honeywell 6000 series computer but can operate on any compatible system. No special computer equipment is required.

E. INPUT-OUTPUT

Input consists of the data required to define the runway, the gear, and if K vs h curve generation is desired, (σ,G) input pairs.

Output data is listed with identifying headings. Normal output shows runway characteristics, gear characteristics, and pavement stress. The wheel sub-totals as a function of gamma can be listed using a program option. When (σ,G), input pairs are supplied, the data for K vs h curve generation is printed out.

F. ADDITIONAL REMARKS

Complete documentation of this program is available from the Engineering Computer Programs Library (ECPL), WES.

DD FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
ISBILD - Static Analysis of Embankments	741-F3-R0071

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Y. Ozawa J. M. Duncan	November 1975	Complete	OP

A. PURPOSE OF PROGRAM

Analyze the state of static stresses and movements in embankments.

B. PROGRAM SPECIFICATIONS

Written in FORTRAN IV Timesharing Program.

C. METHODS

Uses the Finite Element Method of analysis to incrementally construct embankments. Preexisting parts and foundation may be included.

D. EQUIPMENT DETAILS

Remote job entry terminal and central processor.

E. INPUT - OUTPUT

Input is by cards from RJE terminal.

Output comes back to RJE terminal.

F. ADDITIONAL REMARKS

Program is available on WES G-635.

ENG FORM 1 AUG 60 2083

CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Interactive Graphic Pre-Processor for Program ISBILD - GISB	741-F3-R0070

PREPARING AGENCY U. S. Army Engineer Waterways Experiment Station, Automatic Data Processing Center, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
Jim Jones WES	November 1977	Complete	

A. PURPOSE OF PROGRAM

To interactively prepare data for the FEM embankment analysis program ISBILD. Display or generate input geometry and make modifications.

B. PROGRAM SPECIFICATIONS

Written in FORTRAN IV Timesharing Program.

C. METHODS

Interactive graphic procedure using GCS software.

D. EQUIPMENT DETAILS

Low speed terminal, Central processor.

E. INPUT - OUTPUT

Input may be entered interactively from terminal or read from a previously prepared data file.

Output may be displayed and saved for use in other programs.

F. ADDITIONAL REMARKS

Program is available on WES G-635.

ENG FORM 1 AUG 60 2883

10. Earthquakes & Dynamics

CATEGORY A

ELECTRONIC COMPUTER PROGRAM ABSTRACT

TITLE OF PROGRAM	PROGRAM NO.
Vertical Propagation of Shear Waves Through a Horizontally Layered Soil/Rock System (SHAKE 2)	741-F3-R0005

PREPARING AGENCY U of California, Berkeley/U. S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory, P. O. Box 631, Vicksburg, MS 39180

AUTHOR(S)	DATE PROGRAM COMPLETED	STATUS OF PROGRAM	
		PHASE	STAGE
1. Schnabel, P. B. 2. Lysmer, J. 3. Frank McLean Modified	1 Jan 72 - original 31 Dec 73 - MOD 5		

A. PURPOSE OF PROGRAM

The program computes the response in a layered soil/rock system subjected to transient, vertically traveling shear waves.

B. PROGRAM SPECIFICATIONS

Program in FORTRAN IV.

Program requires 40^{K} memory for execution on GE 635 system.

C. METHODS

The method is based on Kanai's solution to the wave equation and the Fast Fourier Transform algorithm. A varied set of operations of interest in earthquake response analysis can be performed.

D. EQUIPMENT DETAILS

Original CDC 6400, later adaptions to Univac 1108 and IBM 360/370.
This version adapted to GE 635 -- card reader, printer, punch required.

E. INPUT-OUTPUT

Input -- punched cards
Output -- printed; punched cards

F. ADDITIONAL REMARKS

Program distributed by NISEE/Computer Applications.
This version obtained July 1974 and adapted to GE system.
Source reference: EERC 72-12
College of Engineering, University of California, Berkeley, California.
Complete documentation of this program is available from the Engineering Computer Programs Library, Technical Information Center, WES, Vicksburg, MS 39180

ENG FORM 1 AUG 68 2883 PREVIOUS EDITIONS ARE OBSOLETE.

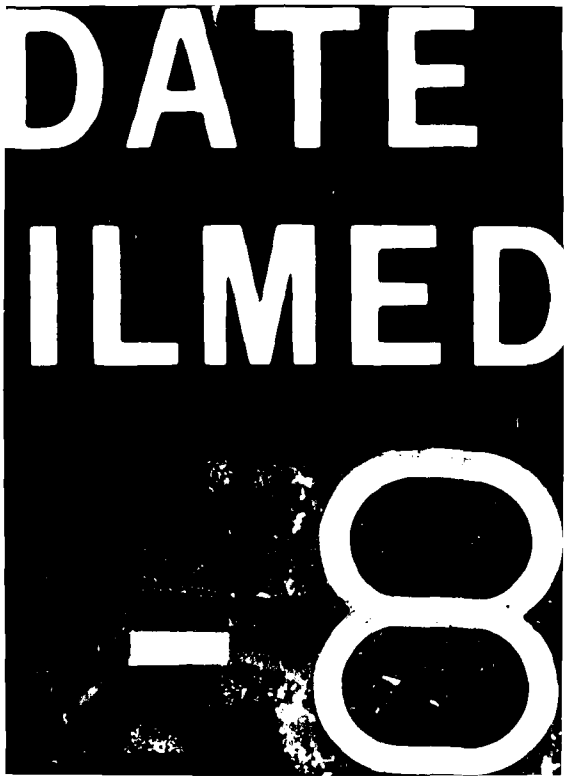
In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Radhakrishnan, N.
List of soils, soil structure interaction, and other related computer programs available for LMVD engineers : final report / compiled by N. Radhakrishnan and Paul K. Senter (Automatic Data Processing Center). -- Vicksburg, Miss. : The Station ; Springfield, Va. : available from NTIS, [1981].
146 p. : ill. ; 27 cm. -- (Technical report / U.S. Army Engineer Waterways Experiment Station ; K-81-1).
Cover title.
"May 1981."
"Prepared for U.S. Army Engineer Division, Lower Mississippi Valley."

1. Computer programs. 2. Soil mechanics. 3. Soils. 4. Structural engineering. I. Senter, Paul K. II. United States. Army. Corps of Engineers. Lower Mississippi Valley Division. III. U.S. Army Engineer Waterways Experiment Station. Automatic

Radhakrishnan, N.
List of soils, soil structure interaction : ... 1981.
(Card 2)

Data Processing Center. IV. Title V. Series: Technical report (U.S. Army Engineer Waterways Experiment Station) ; K-81-1.
TA7.W34 no.K-81-1


DATE
ILMED
-8